AMERICAN AGRICULTURIST

FOR THE

Farm, Garden, and Household.

"AGRICULTURE IS THE MOST HEALTHFUL, MOST USEFUL, AND MOST NOBLE EMPLOYMENT OF MAN."—WASHINGTON.

ORANGE JUDD COMPANY, PUBLISHERS AND PROPRIETORS. Office, 245 BROADWAY.

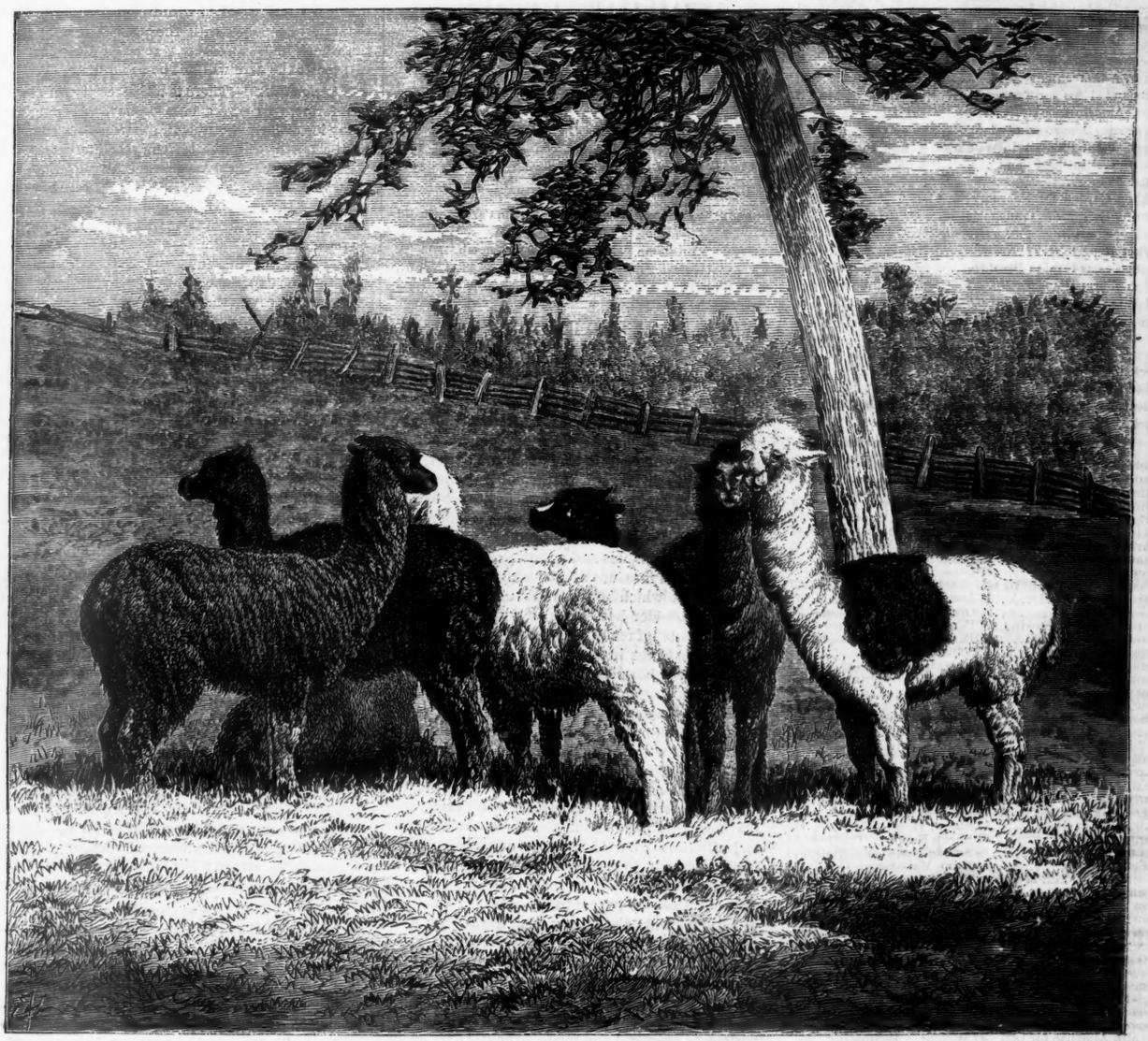
ESTABLISHED IN 1842.

Published also in German at same rates as in English.

TERMS: $1.50 PER ANNUM IN ADVANCE; 4 Copies for $5; 10 for $12; 20 or more, $1 each; 10 Cents additional must be sent with each Subscription for postage.—Single Number, 15 Cents.

Entered according to Act of Congress, in January, 1877, by the ORANGE JUDD COMPANY, at the Office of the Librarian of Congress, at Washington.

VOLUME XXXVI.—No. 2. NEW YORK, FEBRUARY, 1877. NEW SERIES—No. 361.



A FLOCK OF ALPACAS.—DRAWN FROM A PHOTOGRAPH.—*Engraved for the American Agriculturist.*

The Alpaca, a flock of which is represented in the above engraving, is sometimes classed as a sheep, and sometimes as a goat. It is, however, not properly either of these, but belongs to the genus *Llama* of the Camel family, and is closely allied to the Camel. It is a native of the mountainous portions of Peru, where it thrives upon the coarse and scanty forage found in such situations. The engraving is from a photograph of a flock, imported about a year ago by the late ex-governor Thomas, of Maryland, and which was sold and dispersed last summer, by order of the executors of the Thomas estate. What disposition was made of the animals, we have not learned, but hope that they fell into the hands of parties who are willing and competent to give them a full trial in this country. The animal is valuable for its fleece, and in its native country it serves as a beast of burden, being used to carry packs up and down the rugged mountain roads. The fleece consists of a long, lustrous, hairy wool, or wooly hair, which is fine and elastic. From this is made the fabrics known as "alpaca," and many small wares, such as braids and tassels. From other varieties, having somewhat different wool, softer kinds of goods, including gloves, are made. Their usefulness here will depend altogether on their becoming acclimated in this country. Considering the great diversity of climate and locality we possess, there can be but little doubt that, if the Alpacas are tested in the right place, they will adapt themselves to it. The proper locality for their acclimation would seem to be some mountain region, of which we have sufficient to accommodate all the animals we might need to supply all our manufactures. The flesh of the Alpaca is eatable, and the animal is very docile and easily kept. Its form is picturesque, and should make it sufficiently attractive and promising, to induce some persons of wealth and enterprise, who possess country places, to experiment with it, not only for their own pleasure, but for the possible or probable public advantage that might accrue from it.

Contents for February, 1877.

Alpacas, Flock of..... *Illustrated*..41
Among the Farmers—No. 13 54
Bee Notes for February.....49
Boys and Girls' Columns—A Drawing Machine—How the Boy's Eyes Sparkled—Fun for a Winter Evening—The Doctor's Correspondence—Aunt Sue's Chats—Puzzle Box—Dressing the Hair, 6 *Illustrations*..65-68
Catalogues Received.....75
Cheap Greenhouses.....2 *Illustrations*. 63
Chickens, Early.....57
Closet in an Ice House, Ventilation in a.. *Illustrated*..58
Connecticut Agriculture.....49
Corn Crib, A Rustic .....*Illustrated* .56
Cow, Marks of a Good Milk. .....3 *Illustrations*..53
Dog Kennels.....3 *Illustrations*..56
Evener, A Three-Horse .....*Illustrated*. 56
Flower Garden and Lawn for February.....45
Flowers, How they are Fertilized..... 62
Forage Plant, A Useful.....*Illustrated*..59
Greenhouse and Window Plants for February..... 45
Halter, A Convenient 57
Hints and Helps for Farmers.....9 *Illustrations*..57
Hops, American.....51
Household Department—Home Topics—Art with Scissors—Plant Shelves in Windows—Cover to a Pork Barrel—Painting Floors.....6 *Illustrations*..63-65
House Plan.....4 *Illustrations*..52
Kitchen Garden for February.....43
Manure, Baling for Transportation.....*Illustrated*. 53
Manure, Spreading.....3 *Illustrations*..57
Market Report for February.....45
Mentzelias as Garden Plants.....*Illustrated*..61
Ogden Farm Papers, No. 84 — Summer-Fallowing—Earth Closet System—Jersey Cattle.....50-51
Pine Umbrella of Japan.....*Illustrated*..61
Poultry House, Plan for a.....3 *Illustrations*..59
Science Applied to Farming.....49
Stock for Butter.....55
Subscription Terms, Change in.....46
Wheat Crops, Hoeing .....*Illustrated*..55
Work, Hints About for February.....42

INDEX TO "BASKET," OR SHORTER ARTICLES.

Akebia, Fruiting the.....47
Apples, Bitter Rot in.... 75
Artichoke, Jerusalem....49
Ashes and Salt, How to use73
Barley, Fall and Spring...46
Botanic Garden and Arnold Arboretum.....48
Botany, Japanese..... 75
Brown Bread.... 47
Cubic Feet in a Ton of Hay46
Carrots for Stock.....46
Cheese Factories 46
Clover on Snow, Sowing..74
Clover Seed, To Hull.... 75
Corn Bran, Value of.....47
Corn in Drills.....73
Corn Stalks, Use of.....74
Cotswolds for Rhode Island47
Cow, A Barren... 74
Cream, Foaming of.....47
Cream Cakes, Boston.....48
Cribbing and Worms.....73
Croquettes.....48
Dairy Journal 74
Death of E. G. Henderson49
Early Laying and Hatching74
Eggs, To Pack Safely.....74
Fair, Florida State.....74
Farmer's Clubs.....47
Fistula in the Jaw... 75
"Florida Fever".....74
Florida Paper and Map...46
Forage Plants.....47
Fowls Eating Feathers...73
Fowls, House for 1000.....74
Fowls, Langshan 73
Fragariculture.....48
"Game Grass".....47
Geese, Toulouse.....74
Grasshoppers in Kansas..46
Grist Mills, Small Farm..75
Guano, Fish.....75
Guernseys or Jerseys. ...74
Health Almanac for 1877..47
Heaves, Cause of.....73
Horse, Difficulty of Breathing in a.....75
Household Management and Cookery, Book on...48
How to be a "Professor".74
Humbugs, Sundry.... ...47
Jersey Cows in California.46
Ladders, Extension.....74
Land in Florida, Government.....75
Lime, Use of.....74
Orange Tree, A Famous 73
Persimmon, The Japanese75
Petroleum in Tobacco Culture 74
Pigs, How to Feed Young.74
Plant, The Tannin..... 74
Plants, Giving Credit for..74
Plow, Draining.....47
Plow, Swivel. 47
Potato Puff.....47
Poultry, Diseases of Domestic.....46
Primroses, Double Chinese47
Sausage Meat 48
Seed Firm, Change in a...48
Seeds and Sea Water.....74
Sheep, How to Feed Old. 74
Sheep Keeping, Profit of..74
Smoke House, Ventilation74
Soap Manufacturers.....48
Sorento and Inlaid Work.46
Spavin Cure.....75
"Sport" in England, Cost74
Stable Floor.....73
Subscription Terms, Change in 46
Sweeny in the Shoulders..73
The Illus. Adelaide News.75
The Lord's Land.....47
Tomato, 100 Days.....47
Tree Labels 46
Turnips and Beets, Drill for46
Weight, Estimating by Measure.....46

"Walks and Talks."

The writer of "WALKS AND TALKS ON THE FARM," published in the *American Agriculturist* for ten years or more, has during the past 14 months been quietly attending to his farm-work, gathering experience and observation, and in writing a Book on Manures, now about completed. We take pleasure in announcing that he will resume his pen in the next number of the *American Agriculturist*, in a new series of articles "TALKS ON FARM CROPS," to continue through the year. This will be a pleasant announcement to many of our readers, who have "walked and talked" with him in past years.

Calendar for February.

Day of Month.	Day of Week.	Boston, N. England, N. York State, Michigan, Wisconsin, Iowa, and Oregon. Sun rises.	Sun sets.	Moon rises.	N. Y. City, &c., Philadelphia, New Jersey, Penn., Ohio, Indiana, and Illinois. Sun rises.	Sun sets.	Moon rises.	Washington, Maryland, Virginia, Kentucky, Missouri, and California. Sun rises.	Sun sets.	Moon rises.
		H. M	H. M	H. M.	H. M.	H. M.	H. M.	H. M	H. M	H. M.
1	T	7 14	5 14	9 40	7 10	5 18	9 39	7 6	5 22	9 39
2	F	7 13	5 16	10 54	7 9	5 19	10 51	7 6	5 23	10 50
3	S	7 11	5 17	morn	7 8	5 21	morn	7 4	5 24	morn
4	S	7 10	5 19	0 6	7 7	5 22	0 2	7 3	5 25	0 0
5	M	7 9	5 20	1 16	7 6	5 23	1 10	7 2	5 26	1 5
6	T	7 8	5 21	2 24	7 5	5 24	2 20	7 1	5 28	2 13
7	W	7 7	5 22	3 28	7 3	5 25	3 22	7 0	5 29	3 15
8	T	7 5	5 24	4 24	7 2	5 27	4 18	6 59	5 30	4 11
9	F	7 4	5 25	5 14	7 1	5 28	5 7	6 58	5 31	4 59
10	S	7 3	5 26	5 52	7 0	5 29	5 47	6 57	5 32	5 40
11	S	7 2	5 27	6 27	6 59	5 30	6 21	9 56	5 33	6 15
12	M	7 0	5 29	6 56	6 58	5 32	6 48	6 55	5 34	6 43
13	T	6 59	5 30	sets	6 56	5 33	sets	6 54	5 35	sets.
14	W	6 58	5 31	6 57	6 57	5 34	6 59	6 52	5 37	7 0
15	T	6 56	5 33	8 1	6 54	5 35	8 1	6 51	5 38	8 1
16	F	6 55	5 34	9 4	6 52	5 36	9 5	6 50	5 39	9 4
17	S	6 53	5 35	10 11	6 51	5 38	10 8	6 49	5 40	10 5
18	S	6 52	5 37	11 19	6 5	5 39	11 16	6 48	5 41	11 12
19	M	6 51	5 38	morn	6 48	5 40	morn	6 46	5 42	morn
20	T	6 49	5 39	0 30	6 47	5 41	0 26	6 45	5 43	0 21
21	W	6 48	5 40	1 44	6 46	5 42	1 39	6 43	5 45	1 32
22	T	6 46	5 41	2 55	6 44	5 43	2 48	6 42	5 46	2 41
23	F	6 45	5 43	3 58	6 43	5 44	3 50	6 40	5 47	3 43
24	S	6 43	5 44	4 51	6 41	5 46	4 45	6 39	5 48	4 38
25	S	6 41	5 45	5 33	6 40	5 47	5 26	6 38	5 49	5 21
26	M	6 40	5 46	6 6	6 38	5 48	6 3	6 36	5 50	5 59
27	T	6 38	5 48	6 33	6 37	5 49	6 32	6 35	5 51	6 29
28	W	6 36	5 49	6 57	6 35	5 51	6 57	6 34	5 52	6 57

PHASES OF THE MOON.

MOON.	BOSTON.	N. YORK.	WASH'N.	CHA'STON	CHICAGO.
	D. H. M.	H. M.	H. M.	H. M.	H. M.
3d Quart.	5 0 16 mo.	0 4 mo.	11 52 4th	11 40 4th	11 10 4th
New M'n	13 4 15 mo.	4 3 mo.	3 51 mo	3 39 mo.	3 9 mo.
1st Quart	20 11 32 ev.	11 20 ev.	11 8 ev.	10 56 ev.	10 26 ev.
Full M'n	27 2 30 ev.	2 18 ev.	2 6 ev.	1 54 ev.	1 24 ev.

AMERICAN AGRICULTURIST.

NEW YORK, FEBRUARY, 1877.

It is generally accepted as a truth that the more intelligent a man may be, the more valuable will be his labor. While this is true of all industries, it is especially so in regard to the cultivation of the soil. There are so many circumstances which affect or control the result of a farmer's labor, that he, more than all other men, should be well informed as to the principles and practice of his industry. A very certain measure of a person's intelligence is the extent to which he reads or studies. It is interesting to consider how much or how little farmers are in the habit of reading. A recently published list of Farmer's Clubs in the several States and Territories, which shows that there are 1,897 of these institutions, may throw some light on this question. This is very favorable as far as it goes. But every Farmer's Club ought to have a library, at least for reference, if not for circulation amongst the members. This should be the first requisite for the successful conduct of a club. Now of these 1,897 clubs, only 548 have libraries, and of these libraries only 165 have over 100 volumes. Of the rest, a large majority have from 10 to 30 volumes only; while 1,349 Farmer's Clubs are without a single book. What do the members of these clubs talk about? Without books or papers to inform them, the conversations and discussions can have very little good result. Perhaps this fact accounts for the many wide differences of opinion that exist about very simple matters or questions that are as certainly settled as that the sun rises and sets. Things are constantly talked about and discussed, and experiments proposed and made, over and over again, that have been decided years ago, and the results given in standard and perfectly trustworthy books. A library of at least 100 volumes should belong to every Farmer's Club. This could be purchased for $250 or thereabouts. If there were 25 members only, the cost would be $10 each, and every member would practically own the whole $250 worth for his share of the cost. It is not too much to say that every member would realize the value of his share every year, for there is no place where useful knowledge can be put to more profitable practice than the farm, garden, or orchard.

Hints about Work.

In the Southern States, farmers are busy preparing their ground or planting spring crops, while in the North we are only beginning to think about them. Both there and here, everywhere in fact, early preparations lead to the best results. To have everything ready when the need comes, is the business of the prompt farmer, and the southern farmers should now have all their contracts made for help, their fertilizers secured, and their seed on hand. It has been clearly shown that it is wise to provide for a large increase in the fodder and grain crops, and the number of stock kept in the Southern States. Aside from the difference is climate and seasons, what is good for the northern farmer is advantageous for the southern farmer. Oats sown this month will not tiller like the fall sown; 2 to 2½ bushels of seed will be needed.

Clover Seed may now be sown on the wheat. This plant will thrive nearly all over the Southern States if care be taken with it. A liberal dressing of superphosphate with the seed will help both the wheat and the clover. If sown alone, a peck of seed to the acre will not be too much.

Grass and Hay.—There is no necessity for southern farmers to buy a bale of hay. Although, in many localities, timothy and other grasses common at the north will not thrive, yet blue grass and some of the hitherto despised native grasses, will grow almost everywhere, yielding both hay and pasture. Instead of fighting out the grass as heretofore, many southern farmers are encouraging it—or rather letting it alone—which is encouragement enough for the Bermuda and Crab grasses—with profit. The experience of the past year, in Georgia especially, proves that grass may be made more profitable than cotton acre for acre.

Stock.—Humanity, as well as interest, demands the best attention to live stock. To keep every animal well fed, clean and comfortable, is a profitable and a kindly act. A humane man should suffer to see cows standing in filth, and with their flanks covered with it. A cow or any other animal continually kept in such a condition is a disgrace to any man, and a direct injury to his pocket as well.

Winter Wheat.—Last season the bare ground, deeply frozen, was an injury to the wheat, while this season the deep snow gives occasion for fears. The farmer rarely escapes one or the other extreme, except by constant watchfulness. Now he must look to the outlets for water from his field, so that the ground may not be flooded when a thaw comes. If it is intended to top dress the wheat or rye, this should be postponed until it is probable that the manure would not be washed away with the melting snow. Such contingencies as this prove how much better it is to have the wheat crop manured before winter sets in, or before it is sown.

Spring Wheat.—In districts where spring wheat can be grown, it would be well to remember that this grain, at present, brings a comparatively high price. Where everything is favorable, as much land as possible should be prepared for it. A dressing of 150 pounds of nitrate of soda, upon a clean corn stubble, either fall plowed or plowed early in spring, would make a good preparation for this crop.

Manure.—The manure from the stables and sheds should be piled as it is hauled out. A square, compact heap, kept well built at the sides, and flat on the top, will retain sufficient heat to resist frost, and the manure will rot rapidly in the coldest weather. Fresh additions on the top will soon heat, and by and by the whole may be turned over and rebuilt, the outside portions being placed in the centre of the new heap. Managed in this way the manure will be in excellent condition for use in the spring. If free from long stalks or straw, the manure will be fine and well rotted.

Milk Cows.—Cows that are to come in early should be dried off in good time. It is not economy to milk cows as long as a few pints may be drained from them. The drain on the system in nourishing the calf is enough for the cow to bear. If the cow is a copious milker, care must be exercised in feeding, lest in the new flush of milk garget may occur. To avoid this, feed low; *give no corn meal* whatever, and it is safest to give nothing but hay and some roots. There need be no apprehension if a large heavy udder is not shown before calving. It will be the safer, and the flow of milk may easily

be encouraged when the calf is a week or two old, and danger of inflammation is passed. Every farmer cannot have his cows fresh in the winter, nor can every dairyman or woman make winter butter of first quality, but those who can do these things are able to get double the profits from their cows that others do, and have their dairy work come at the season when there is little else to be done—a matter for smart farmers to think over.

The Card.—A pair of cards ought to be kept in every cow stable, and they should be frequently used. A clean, sleek hide is a credit to the owner and a comfort to the animals. We have carded bulls, cows, and calves every day in the winter, and occasionally in the summer, for many years, and never found our stock to be troubled with lice. Cattle that have been purchased have sometimes been found lousy, but after a few applications of the card, dipped in kerosene, the vermin disappeared. The carding, and the brushing afterwards, should be done before the milking. There will be no complaints then of specks in the milk. In place of the brush, a brisk rubbing with a handful of soft oat straw will give a good finish to a carding.

Horses.—Idle horses may be kept in a straw yard with an open shed for shelter. A few ears of corn, given daily, will keep them in good condition. Brood mares, at least, should have as much exercise as this. Horses kept in stables should be well curried and brushed. A sharp curry-comb is a nuisance in a stable, and makes many nervous horses fractious and irritable. The sharp teeth may easily be rubbed down with a file or a whetstone. To clean a curry-comb, dip it into a solution of common sal-soda, rinse it about a short time, and then wash it in hot water. When the coat begins to shed, a pint of linseed-cake meal may be given daily to each horse with benefit.

Fattening Cattle.—A change of food will be of great help in quickening the appetite of stall fed cattle. A pint of molasses, mixed with a feed of cut straw and meal, will be taken very readily. This may be given once a day, and one to two ounces of salt with an alternate feed. Roots, sliced and sprinkled with either cotton or linseed-cake meal, will be very healthful. A few apples will be useful between meals. A pound of meal stirred in the drinking water will help. By varying the food in this way one can hardly overfeed fattening stock so as to pall the appetite.

Sheep, feeding for the butcher, can profitably consume, according to the size, from one to two pounds of grain per day, with hay, straw, and 6 to 12 pounds of roots. It will not pay, as a rule, to keep fattening sheep to save the fleece after they are ripe for market. The value of the pelt always enters into the price given by the butcher, and to feed sheep two months to save the value of the pelt, and then find this deducted from the price of the sheep, is not a pleasing surprise. Fat sheep generally sell best this month or early in March.

Lambs.—Every lamb of the right kind now appearing, if within 300 miles of New York, may be made, by proper management, to be worth, three months hence, $8 or more in the market. The raising of early lambs for market is a growing and profitable business. To give all the details of their management would take too much space. They may be learned by studying Stewart's "Shepherd's Manual," in which this branch of sheep feeding is explained at length. The essentials to success are the right kind of sheep; to have lambs early, and to feed well until ready for market. Dry, warm quarters and good food for the ews are indispensable.

Store Sheep can be wintered very well on straw, fed twice a day, with some roots, a pound of hay, and a pint of grain between the morning and evening feeds. No grain or roots should be fed until the morning feed of straw has been eaten clean.

Salt.—A lump of rock salt kept in a shed or under cover, where the animals can lick it at will, is the safest way to give this necessary condiment—given to excess, it is hurtful, especially to pigs.

Pigs.—Dry, warm, well-ventilated, clean pens or yards are necessary for success in raising swine. Disease inevitably accompanies neglect in these things. There is no mystery about the diseases which destroy so many swine. An unhealthy sameness of food, all corn, or all whey, no roots; too much wet, damp and filth; perhaps too close in-breeding, all result in disease, which in time becomes constitutional. A beginning of a better way may be now made with the young pigs to be soon looked for. Provide the brood sows with warm, dry pens, with plenty of bedding of cut straw. Feed corn meal, bran and mangels, turnips or potatoes, and apportion the different kinds of food with regard to the condition of the sows.

Poultry.—Some of the hens that have been laying will brood this month. Provide a warm place for them, where they will be quiet and undisturbed. A sunny corner in a warm stable will do very well for the chicks next month if the fowls are of a hardy breed. These early chickens will make early market birds, and the pullets will lay early.

Seed.—Provide all seed that may be wanted, at once. Choose those kinds that have been carefully grown and free from weeds. Order corn, oats, clover, timothy, and other grass seeds and garden seeds at once, to be on hand when wanted.

Work in the Horticultural Departments.

In January and February, when the majority of our readers can do but little out-door work, it has been our custom to devote these notes to general matters, rather than to details of operations. Last month the Orchard and Fruit Garden received special attention, general plans were discussed, and selections of varieties were given. This month we devote our notes mainly to the Vegetable or Kitchen Garden, and refer to last month for information on fruit culture. If our correspondents will consult the January and February notes before sending us questions about fruit and vegetable culture, they will often find their queries already answered, for the notes are written with the wants of many correspondents in mind.

While we devote our space largely to the Kitchen Garden, the Orchard and Fruit Garden are not to be neglected. In the warmer States planting will be in season, and general spring work fairly open. In northern localities there are often mild spells in February when pruning can be done, and the damp foggy weather so frequent now is a most favorable season for washing and scarping the trunks of neglected trees. Our January remarks in regard to selecting and purchasing, are all the more important now. As spring approaches, every week's delay becomes the more impolitic and dangerous.

Kitchen and Market Garden.

As the heading "Kitchen Garden" has led some to suppose that the notes only applied to the small patch devoted to supplying the table, we adopt a more comprehensive and discriptive title.

Every Farmer within a few hours drive of a market—and a manufacturing village is often a better one than even the famed Washington Market in New York—will find it to his interest to provide for the wants of that market. While he may not care to become a market-gardener, and devote himself to numerous small and often perishable crops, he can at least adopt

Farm Gardening, and greatly to his profit. Roots, such as beets, carrots, parsnips, turnips, etc., cabbages, squashes and celery are among the easily raised crops, always in demand, and which need not be hurried to market. Tomatoes, sweet corn, melons and spinach are perishable, but often profitable. A farmer who is near a market for such things can not afford to go on raising poor crops of Indian corn, rye and buck-wheat.

Books.—No branch of horticulture is better provided with literature than this. "Gardening for Profit" by Peter Henderson, is a useful guide to those who grow vegetables for home use or for sale. "Money in the Garden" by P. T. Quinn is another standard work, and "Farm-gardening and Seed-growing" by J. Brill, is also a most useful work. It will *pay every cultivator* to have all three of these works, as each has its peculiar excellencies, and gives methods and experiences different from the others.

Forwarding Plants.—In the great majority of country gardens the natural "seed time and harvest" are accepted. When it comes time to "make garden" the ground is prepared, seeds are sown and the job done up. As a consequence there is a great supply of vegetables for a month or two and a dearth at other times. A little trouble will prolong the season at both ends. By sowing under glass, the seeds of various tender vegetables, the plants will be ready to set in the open ground at the time seeds can be sown there, thus making a gain of 6 or more weeks, a matter of great importance, especially if the crop is to be sold. This forwarding of the plants is generally accomplished by the use of

A Hot Bed.—We would, if it were practicable, avoid the repetition of matters that have been more than once described, but as our notes are made to meet the wants of our readers, we are obliged to sometimes repeat. A dozen letters or more are at hand asking for directions to make a hot-bed. As strange as it may seem to those accustomed to them, hot-beds are looked upon by many as something difficult to make and to manage.

What is a Hot-Bed?—It is essentially a box covered with glass, containing earth in which to sow seeds, and is heated to the proper temperature (usually) by means of fermenting manure. It may be small, for the wants of a family garden, or large for a market garden, or where plants, such as lettuce, are entirely grown in them, the beds may cover acres of surface. Small hot-beds of less than three, or perhaps two sashes, are not desirable and where but very few plants are needed, they are more readily raised in window boxes, described below.

The Heating Material is generally stable-manure. Every one knows that fresh manure, thrown into a pile, will become hot, often so hot as to burn that at the center of the pile. Manure for the hot-bed must be so treated as to produce a sufficient heat, and at the same time to continue it as long as possible. Manure, long and short together, is placed in a conical pile, and as soon as the escape of steam, or a stick thrust into the center of the heap shows to the hand that the heat is rising, the pile should be turned, this is done by forming it into a new pile by the side of the old one. If the manure appears dry, water it. The use of leaves with the manure modifies the violence of the heat, and at the same time prolongs it. One half its bulk of leaves may be added to ordinary manure, or if it is very free from litter, an equal bulk may be used. The leaves may be evenly mixed with the manure at the first turning, or added when the bed is made up. When the manure has been turned about three times, it is ready for use.

The Sashes.—In cities, or places where there are sash-factories, hot-bed sashes may be bought ready made, either glazed or unglazed. They cost glazed—from $2.50 to $4 each, according to material and make.—They are 3x6 feet, the sides and ends of 1¼ inch pine; 4 bars run lengthwise (there are no cross bars) and rabbeted to receive the glass. A sash of this kind will require 45 lights of 6x8 glass. This is bedded in putty, each pane lapping on the one below it from ¼ to ½ inch, and fastened by tins. No putty is used on top of the glass, but one or more coats of white-lead paint are given.

The Frame.—There are two ways of making a hot-bed. One is, to place the manure in a pit; the other, to build it up in a pile and set the frame upon it, the first being common in market gardens and the other for small hot-beds. In making a pit the earth is excavated 2½ feet deep, 6 feet wide and of a length according to the number of sashes. The pits are lined with rough boards, nailed to posts, and extends above the surface 3 or 4 inches in front and a foot at the rear. Sliders or strips 2 inches wide, extend from front to rear, where every two sashes come together, these have their ends let into the boards of the frame by a dove-tail joint and help to keep the frame firm. A narrow strip is nailed in the middle of every slider, to make a guide to hold the sash in place when sliding it up or down. The other style of frame is usually made to fit three sashes;

it consists of a front piece 15 inches high, a back 24 inches high and two end pieces with a regular slope from front to rear. This may be knocked together out of rough boards, or may be made with care, so put together with hooks or clamps, that it may be taken apart and stored away when not in use. This has sliders running from front to rear.

Making the Beds.—In case a pit is used, of course the place selected must be one where no water will stand in it. The sashes should slope to the south or south-east. If there is no shelter at the north or north-west, such as a fence or building, a temporary screen of brush or boards may be put up. The manure being ready, place litter or leaves on the bottom of the pit to the depth of 6 inches, then put on a layer of manure, taking care to distribute long and short evenly, and beat it down with the back of the fork. When the pit is full, tramp it down rather firmly with the feet, to make a level surface; if any soft places are found, add more manure to make all uniform. Then put on the earth. For the hot-bed with the manure above ground, put down four stakes to mark the corners of the pile, which should be a foot larger than the frame at each side and end. Put down a layer of any coarse litter or old pea-brush, and build up the pile gradually, being guided by the corner stakes. The manure should be laid on evenly, a forkful at a time, the edges of the bed kept firm and even and the manure well beaten down as the work goes on. The pile should be 3 feet high, and so well made that it will settle all alike. The loose fine manure that is left is to be carefully shoveled up and spread on top of the pile. The frame is put on and the earth added. Sometimes a compromise between these two methods is adopted. Instead of making the bed on the ground, an excavation two feet deep and two feet longer and wider than the frame is made, but not boarded up, and the pile built up in this. The more solidly the manure is packed, the slower and more long-continued will be the heat; where there is a large share of litter or leaves, there is little danger of making it too compact, but either extreme must be avoided.

The Earth should have been prepared last autumn and stored under shelter, ready for use. It should be rich, fine, and open. Good garden soil, with thoroughly rotted manure, and enough sand to keep it from becoming close, make the best. If this has not been prepared, the best soil obtainable, with a handful of fine bone or guano to each sash, thoroughly mixed with it, and turned each day for a week, will answer. The depth of soil will depend upon the use to be made of the beds. If the seeds are sown directly in the soil, six inches will be required. If boxes or "flats" are to be used, then the rich soil is put into these; any common soil, to the depth of 2 or 3 inches, on which to set the boxes may be put on the manure.

Boxes or Flats are made from soap boxes or other empty cases to be had of the grocer. One box will make two, or three; they are simply shallow boxes 2 inches deep, with a bottom securely nailed on. Seeds are sown in these, young plants transplanted to them, and plants are often sold in them.

When to make the Hot-Bed.—Generally it is safe to start the bed six weeks in advance of the time that plants may be put into the open ground. Some seeds need more heat than others; some plants will be sooner ready than others, and a few, such as egg plants, peppers, etc., should not go out until quite warm weather—hence to meet their requirements it is well to sub-divide the hot-bed, by cross-wise partitions, that each may be managed differently.

Sowing the seeds.—The bed being made and the sash put on, a strong heat will soon arise. A thermometer placed in the soil will show probably over 100°. Wait until the violent heat passes off, and when the mercury has fallen to 90° or 80°, the seeds may be sown in rows 4 inches apart, from front to rear. If boxes are used, the seeds may be sown in the work-shop or other convenient place and set in the beds when the violent heat is over.

Watering and other care, must be given as to seeds elsewhere. Use a watering-pot with a very fine rose (or sprinkler), and use water with the chill removed. Pick out weeds as they appear. The earth between the rows should be stirred now and then with a small pointed stick to keep it open.

Airing, shading and covering.—A hot-bed requires daily care. An hour or two of neglect may ruin its contents. In the morning, the upper ends of the sashes must be lifted, more or less, according to the outer temperature, for the escape of the superfluous heat and the admission of fresh air. They must be closed before the bed becomes too cool, usually by 3 or 4 o'clock in the afternoon. The nearer the temperature within the bed can be kept at 75° the better. If shading is needed, as with recently transplanted plants, and old sheet may be thrown over the glass. Cool nights there will be great loss of heat and the glass must be covered either with straw mats, board shutters, rugs, or other protection.

Other Matters.—A long wedge-shaped piece of wood will be needed to each sash; by putting this under the upper edge of each, the sash may be lifted from one to three inches. Straw-mats are the best covering, and are handy for various uses. There are several ways of making them, but none equal to that described in the *American Agriculturist* in April and May, 1875. The account is quite too long to repeat, but it will pay any one who uses straw-mats to send for those two numbers. Some gardeners use, instead of mats, shutters the size of the sashes, made of half-inch stuff, and well secured with cleats. If very cold weather, it will be well to bank up the higher side and ends of the bed—if made in a pit, with manure. If this is not at hand, leaves or litter will be better than nothing. Look out for sudden wind squalls, when the sashes are tilted, else there will be a scattering of sashes and breaking of glass.

Cold-Frames are precisely like hot-beds without manure, and set upon the surface of the ground; they should have the sides and ends banked up with earth or litter. They will be useful later to receive and harden off plants that have been raised in the hot-bed. Seeds may be sown in them, and gain considerably over those in the open ground. For these all the appliances, especially mats or shutters, are needed that are required with hot-beds. Set the cold frame to catch the sun's rays; have it well banked up. Cover the sashes in the afternoon, and open them to the sun in the morning. By this treatment the soil within will soon get warm, and seeds may be sown—the treatment of the plants in all respects being the same as if they were in a hot-bed. Flats may be used in them also.

Sowing in Window Boxes.—Those who need only a few plants can raise them without the trouble of a hot-bed or cold-frame in boxes set in a kitchen window. The flats already described may be used, or any other box will answer. We prefer the kitchen window, though any other sunny window will do, because the atmosphere is generally moister, and from frequent opening of the doors the air is better. Watering must be attended to; when the plants are up, turn the boxes every day, to keep them from growing to one side; when they have made two rough leaves (besides the seed-leaves) transplant to other boxes, giving room according to the size of the plant. As the weather becomes warmer, the boxes may be set in the sun outdoors in the warm portion of the day; this will harden off the plants and make them strong.

Seeds.—With every vegetable there are a few varieties that experience has shown to be better than others. The *best* usually cost no more than the poor kinds. We will point out the kinds we have found most desirable.

Novelties are offered every year. Those who can afford the time and the seeds, will find it interesting to make trials of new things, but no one, whether for use or for sale, should depend for his whole crop upon any untested novelty, especially if foreign.

Where and How to get Seeds.—Please do not write to ask us who sells the best seeds. We do not allow any seedsman to advertise unless we believe him to be honest and reliable, hence we do not recommend one in preference to another. Send for catalogues and make your selections early. It makes no difference where one lives, the mail places all in this respect on an equality.

VARIETIES.

Asparagus.—Buy roots and save a year, or raise by sowing Conover's Colossal in open ground early.

Beans.—Bush: Early Valentine, Early Fejee, Dwarf, and Black Wax. Pole: Large Lima, Case-Knife, for shelling, Black Wax, and Horticultural (or Cranberry) for snaps.

Beets.—Early: Egyptian, Bassano. Late: Long Smooth Blood. Swiss Chard, or Sea Kale Beet is useless for root, but the leaves are fine Greens.

Borecole or Kale.—Siberian or German Greens.

Brocoli.—Purple Cape, Walcheren.

Cabbages.—Early: Jersey Wakefield, Early York. Medium: Summer Drumhead, Winningstadt. Winter: Large Late Drumhead, Flat Dutch, Marblehead Mammoth, Savoy.

Carrot.—Early Horn and Long Orange.

Cauliflower.—Early: Erfurt, Early Paris. Late: Autumn Giant.

Celery.—Dwarf White Solid, Boston Market, Dwarf Crimson. Turnip-rooted or Celeriac is used for soups and salads.

Corn.—Early: Early Minnesota, Early Narragansett. Second and main crop: Triumph, Moore's Concord, Stowell's Evergreen.

Cucumber.—Early: Early Russian, Green Cluster. Main crop: White Spine. Pickles: Green Prolific, Long Green Prickly.

Egg Plant.—Long Purple, New York Improved, Black Pekin.

Endive.—Green Curled.

Garlic.—Always raised from sets.

Kohl Rabi, or Turnip-rooted Cabbage, White Vienna.

Leek.—Large Flag, Musselburg.

Lettuce.—Earliest under glass: Boston Market. Earliest open ground: Curled Simpson. Later: Hanson, Large India.

Martynia for pickles—but one sort.

Melon, Musk.—White Japan, Ward's Nectar, Green Citron, Cassaba.

Melon, Water.—Phinney, Mountain Sweet, Ice Cream, Black Spanish.

Nasturtium, for pickles.—Tall.

Onions.—South of New York onions rarely succeed from spring sown seeds, and "sets" must be planted; they are sold at the seed stores. For seed. Early: The Queen. Main crop: Wethersfield Red, Yellow Danvers, White Globe.

Okra.—Long Green.

Parsnip.—Cup or Hollow Crown.

Parsley.—Double Curled, Fern-leaved.

Peas.—Earliest: Carter's First Crop, or Dan'l O'Rourke; Laxton's Alpha is but a few days later, and vastly better than any very early pea. Medium: McLean's Advancer. General crop: Champion of England, to which no pea is superior. Dwarfs are convenient to occupy odd places. Little Gem and Blue Peter are the best of these.

Peppers.—Sweet Mountain, for stuffed pickles; Squash for pickles; Red Chili for pepper-sauce.

Potatoes.—Only the earliest varieties should take up the room of the garden, such as the Alpha, Early Vermont, Thorburn's Paragon, or Early Rose.

Radish.—Scarlet Turnip, Olive-shaped, and French Breakfast, take up but little room, and may be grown in spare places in hot-bed or frame, or in open ground with early beets and carrots to mark the rows; the best long is Long Scarlet Short-top; California and Rose-colored China are best winter sorts, sown late the same as round turnips.

Salsify and Scorzonera, the latter called Black Salsify, are both excellent, and where known will always be sown. But one kind of each.

Spinach.—Round-leaf for spring and fall; the New Zealand for midsummer.

Squash.—Early: Summer Crook-neck. Medium: Boston Marrow. Late: Hubbard, Marblehead, Butman, Yokohama.

Tomato.—Early: Conqueror. Main crop: Trophy. See catalogues for fancy sorts.

Turnip.—Earliest and latest sowings: Red-top Strap-leaf. Winter: Long White French, Yellow Stone, Golden Ball.

Odds and Ends.—Sage, Sweet Marjoram, Thyme, Summer Savory, Sweet Basil, Tarragon (roots), Pepper grass or Cress, Strawberry Tomato (preserves.)

Sow in Hot-Bed, Cold-Frame or Window Boxes, Broccoli, Early Cabbage, Cauliflowers, Lettuce, Pepper, Tomato and Egg Plant; Cucumbers, Bush Squash and Melons may be sown in small pots, the ball of earth to be turned out into the open ground; sow several seeds in each, and leave but one or two plants to grow. Pieces of sod, 3 inches square will answer instead of pots; these are placed grass-side down and the seeds sown in the earth side; the sod containing the roots is set out.

Flower Garden and Lawn.

The main work out of doors in this department during February, will be to keep the snow shoveled away from the lower branches of evergreen shrubs and trees, else they are likely to be broken by the alternate melting and freezing. During heavy storms snow will often accumulate to such an extent as to break the large branches; when it is possible to jar off the snow it should be done.

Greenhouse and Window Plants.

For general care we must refer to last month's notes.

Propagation.—Those who grow plants for sale are now busy in increasing their stock. Those who need plants for bedding out should be preparing them. If a regular propagating house is not provided, a frame covered with a sash, on the warmest part of the greenhouse bench will answer; this should contain two or three inches of clean sand, free from salt; small cuttings of tender shoots, root more rapidly than older ones. As soon as roots form, pot off into small pots of rich soil.

Pots should be in readiness, and if old ones are used, have them carefully washed both inside or out.

Commercial Matters—Market Prices.

The following condensed, comprehensive tables, carefully prepared specially for the *American Agriculturist*, from our daily record during the year, show at a glance the transactions for the month ending Jan. 12th, 1877, and for the corresponding month last year: and also for the year ending Dec. 31, 1876:

1. TRANSACTIONS AT THE NEW YORK MARKETS.

RECEIPTS.	*Flour.*	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats.*
25 d's *this* m'th	207,000	791,000	904,000	92,000	227,000	517,000
24 d's *last* m'th	335,000	2,267,800	2,353,500	126,000	560,000	1,050,000
SALES.	*Flour.*	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats.*
25 d's *this* m'th	294,000	2,338,000	1,469,000	50,500	239,000	601,000
24 d's *last* m'th	381,000	2,414,000	2,387,000	97,000	312,000	928,000

2. *Comparison with same period at this time last year.*

RECEIPTS.	*Flour.*	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats.*
25 days 76-7	267,000	791,000	904,000	92,000	227,000	517,000
25 days 75-6	332,000	735,000	1,017,000	39,000	231,000	593,000
SALES.	*Flour.*	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats.*
25 days 76-7	294,000	2,338,000	1,469,000	50,500	239,000	601,000
25 days 75-6	393,000	2,814,000	1,871,000	47,000	284,000	1,918,0 0

3. *Stock of grain in store at New York.*

	Wheat. bush.	*Corn.* bush.	*Rye.* bush.	*Barley.* bush.	*Oats.* bush.	*Malt.* bush.
Jan. 8, 1877	3,668,010	3,077,504	341,750	905,615	1,083,104	425,406
Dec. 11, 1876	3,110,283	3,385,574	218,841	873,310	1,182,322	512,041
Nov. 8, 1876	2,048,233	3,206,003	294,381	478,141	1,002,891	495,640
Oct. 9, 1876	1,931,892	1,195 387	153,305	91,245	825,187	421,751
Aug. 7, 1876	2,231,299	904,537	94,960	53,914	1,237,895	431,208
Apr. 10, 1876	3,393,074	232,140	68,429	200,381	706,282	436,942
Jan. 10, 1876	5,802,393	663,982	100,711	365,191	1,080,300	307,433

4. *Receipts of Breadstuffs in New York in each of the last eight years:*

	Flour. bbls.	*Wheat.* bush.	*Corn.* bush.	*Rye.* bush	*Barley.* bush.	*Oats.* bush.
1876	8,832,732	26,866,221	26,657,669	1,611,912	6,746,198	12,140,676
1875	8,940,272	34,214,736	22,485,707	391,654	4,707,346	10,656,077
1874	4,017,207	11,817,315	29,320,000	592,114	2,776,025	10,732,919
1873	3,546,068	33,559,870	24,559,345	992,447	2,448,526	11,235,420
1872	3,030,771	16,229,418	25,202,156	491,563	5,117,851	12,486,318
1831	3,649,045	26,518,360	27,108,156	1,055,621	3,869,123	12,546,966
1870	4,143,993	24,083,742	9,143,478	550,169	5,020,718	9,626,606
1869	3,535,716	23,813,652	11,666,784	357,803	3,007,958	8,747,322

5. *Exports from New York, Jan. 1 to Dec. 31.*

	Flour.	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats.*
1876	1,894,158	24,227,852	15,991,817	1,337,164	88,132	619,554
1875	1,954,180	26,192,693	12,938,740	206,898	1,505	133,752
1874	2,177,608	31,791,249	19,000,995	641,661	3,560	122,528
1873	1,655,331	27,801,829	15,587,527	1,009,148	19,376	49,710
1872	1,179,059	13,144,956	27,864,000	668,547	23,656	31,480
1871	1,659,755	21,968,643	18,046,570	525,772	98,745	47,310
1870	1,950,231	18,446,035	487,792	92,431	——	28,986
1869	1,582,211	18,240,586	1,637,596	142,542	——	49,393

6. *Comparative Stock of Flour in New York, Jan. 1:*

	1874.	1875.	1876.	1877.
Flour, bbls.	269,751	277,439	419,510	376,000
Wheat, bushels	1,258,990	4,660,711	6,371,296	4,191,341
Corn, bushels	1,272,500	1,146,408	591,690	3,629,038
Rye, bushels	14,630	114,899	115,607	390,891
Barley, bushels	191,400	561,951	513,596	1,858,627
Oats, bushels	471,600	1,288,464	1,321,587	1,891,149
Malt, bushels	26,530	182,775	381,471	656,088
Peas, bushels	12,470	15,139	6,650	13,512

7. *Exports from New York, Jan. 1. to Jan. 12.*

	Flour. bbls.	*Wheat.* bush.	*Corn.* bush.	*Rye.* bush.	*Barley.* bush.	*Oats.* bush.	*Peas.* bush.
1877	39,430	466,708	42,295	7,984	——	4,283	1,606
1876	71,713	521,558	458,833	2,840	——	6,183	32,093
1875	67,408	732,422	480,372	——	——	4,719	5,095

CURRENT WHOLESALE PRICES.

	Dec. 12.	Jan. 12.
PRICE OF GOLD	107 1-4	106
FLOUR—Super to Extra State	$5 00 @ 5 90	$5 25 @ 6 25
Super to Extra Southern	5 00 @ 8 50	5 25 @ 8 75
Extra Western	5 50 @ 9 75	5 75 @10 50
Extra Genesee	5 85 @ 6 85	6 25 @ 7 75
Superfine Western	5 00 @ 5 50	5 25 @ 5 75
RYE FLOUR	3 00 @ 5 20	3 00 @ 5 20
CORN-MEAL	2 70 @ 3 50	2 65 @ 3 60
BUCKWHEAT FLOUR, ₱ 100 lbs	3 35 @ 3 75	3 65 @ 4 00
WHEAT—All kinds of White	1 25 @ 1 50	1 35 @ 1 57½
All kinds of Red and Amber	1 00 @ 1 50	1 05 @ 1 55
CORN—Yellow	56 @ 61	57 @ 63
Mixed	55 @ 60	57½@ 64
White	55 @ 59	58 @ 63
OATS—Western	33½@ 45	40½@ 50
State	46 @ 50	47 @ 53
RYE	80 @ 95	83 @ 95
BARLEY	68 @ 1 15	65 @ 1 12½
BUCKWHEAT	83 @ 85	92½@ 95
BARLEY MALT	75 @ 1 25	70 @ 1 30
HAY—Bale, ₱ 100 lbs	50 @ 90	55 @ 1 00
STRAW, ₱ 100 lbs	45 @ 90	55 @ 95
COTTON—Middlings, ₱ lb	12½@ 12¾	13 @ 13¼
HOPS—Crop of 1876, ₱ lb	15 @ 33	12 @ 30
" old, ₱ lb	10 @ 20	10 @ 17
FEATHERS—Live Geese, ₱ lb	45 @ 58	45 @ 58
SEED—Clover, ₱ lb	15¼@ 16	15 @ 16¾
Timothy, ₱ bushel	1 90 @ 1 95	— @ 1 90
Flax, ₱ bushel	1 60 @ 1 65	1 60 @ 1 70
SUGAR—Refi'g & Grocery ₱ lb	8¾@ 11¼	8 @ 11
MOLASSES, Cuba, ₱ gal. 50 test	38 @ 40	Nominal.
New Orleans, new crop, ₱ gal	50 @ 60	40 @ 60
COFFEE—Rio (Gold)	16½@ 20	19 @ 22¼
TOBACCO, Kentucky, &c., ₱ lb	6 @ 18	5 @ 18
Seed Leaf, ₱ lb	4½@ 50	4½@ 50
WOOL—Domestic Fleece, ₱ lb	30 @ 50	28 @ 50
Domestic, pulled, ₱ lb	22 @ 40	22 @ 40
California, spring clip	15 @ 28	15 @ 30
California fall clip	12 @ 22	12 @ 23
TALLOW, ₱ lb	8 @ 8¾	8 @ 8½
OIL-CAKE—₱ ton	37 00 @37 50	36 50 @ —
PORK—Mess, ₱ barrel	16 75 @16 87½	17 25 @18 25
Prime, ₱ barrel	— @14 00	14 00 @14 25
BEEF—Plain mess	10 00 @11 50	10 50 @11 50
LARD, in trcs. & bbls, ₱ 100 lb	10 00 @10 3½	10 75 @11 50
BUTTER—State, ₱ lb	22 @ 37	22 @ 37
Western, poor to fancy, ₱ lb	16 @ 36	16 @ 37
CHEESE	6 @ 15	6 @ 15
BEANS—₱ bushel	1 50 @ 2 40	1 85 @ 3 75
PEAS—Canada, in bond, ₱ bu	90 @ 93	— @ 90
EGGS—Fresh, ₱ dozen	28 @ 33	32 @ 40
POULTRY—Fowls	8 @ 11	9 @ 16
Turkeys—₱ lb	9 @ 16	9 @ 16
Geese, ₱ pair	1 25 @ 2 00	1 25 @ 2 00
Geese, ₱ lb	7 @ 13	7 @ 13
Ducks, ₱ pair	50 @ 1 00	55 @ 1 00
Roosters, ₱ lb	6 @ 8	7 @ 8
Chickens, dry pick'd ₱ lb	9 @ 13	13 @ 17
GROUSE, ₱ pair	50 @ 90	65 @ 80
PARTRIDGE, ₱ doz	40 @ 90	55 @ 62½
DUCKS, Wild, ₱ pair	25 @ 1 50	40 @ 2 00
QUAIL, ₱ dozen	1 25 @ 1 50	75 @ 1 37½
VENISON, ₱ lb	8 @ 18	8 @ 14
RABBITS, ₱ pair	20 @ 35	18 @ 25
HARES, ₱ pair	40 @ 60	25 @ 40
TURNIPS ₱ bbl	75 @ —	75 @ 1 00
CABBAGES—₱ 100	3 00 @ 7 00	4 00 @ 9 00
ONIONS—₱ bbl	1 00 @ 2 75	1 50 @ 4 50
POTATOES—₱ bbl	2 50 @ 3 87½	2 25 @ 3 75
SWEET POTATOES—₱ bbl	3 00 @ 4 00	4 25 @ 5 00
CAULIFLOWER, ₱ bbl	1 00 @ 2 50	— @ —
BROOM-CORN	3½@ 8	3½@ 8
GREEN PEAS, ₱ bush	1 40 @ 1 45	1 25 @ 1 40
CRANBERRIES—₱ bbl	7 00 @ 9 50	7 00 @ 9 00
" ₱ crate	2 75 @ 3 00	2 75 @ 3 00
APPLES—₱ barrel	75 @ 2 00	1 00 @ 2 00
SQUASH, ₱ bbl	1 00 @ 1 75	— @ —
GRAPES, ₱ lb	4 @ 11	— @ —
CIDER, ₱ gal	7 @ 9	7 @ 10

Gold has been up to 107¾, and down to 105⅞, closing Jan. 12, at 106, as against 107¼ on Dec. 12; and 112⅞ on the 13th of Jan, 1876... Stormy weather, fluctuating foreign markets as reported by cable, serious impediments from ice and snow to the transportation of produce, depression in gold, and irregularity in foreign exchange, have all worked against free movements in Breadstuffs, which, however, under much lighter offerings, have been generally held with much more confidence, particularly Flour, Wheat, Oats, and lines or boat loads of Rye, many receivers asking prices toward the close above the views of buyers, thus also impeding operations. The export inquiry has been moderate, but on the increase since the opening of the new year, favored in part by the recent decline in ocean freights, which, for the month, has been quite important, on both berth and charter contracts. The very latest dealings in Flour indicated rather less firmness; in Wheat and Oats a strong range of values; and in Corn, Rye, and Barley, comparative steadiness. Of Wheat, the favorite grade with shippers at the close was No. 2 Milwaukee Spring, of the new crop, which tended upward in price, on a very limited offering....Provisions have been active throughout the month, with wide and frequent fluctuations in Mess Pork and Western Steam Lard, due, in good part, to speculative manipulations here and at Chicago ....Cotton has been more active and quoted higher.... Wool has been moderately sought after, but, in view of the reduced stock, has been held with decided confidence.... Hops have been selling more freely, chiefly for shipment to the London market, but at variable prices, closing with renewed firmness....Seeds have been generally slow of sale, and toward the close quoted rather weak in price.....Tobacco has been moderately sought after at about former quotations....Hay and Straw strong as to values, but not active.....Ocean Grain and General Cargo Freight interests have been depressed, with rates quoted lower, without leading to much show of animation.....Grain rates by steam to Liverpool closed on the 12th of Jan. at 7*d*; to Glasgow at 6¼*d*; to London at 7¼ @8*d*; to Liverpool, by sail, at 6¼@7*d*; London, by sail, at 7@7¼*d*. per bushel. Provisions by steam to Liverpool, 40*s*.@50*s*. per ton; Cotton at $^{9}/_{32}$@$^{9}/_{16}$*d*. ₱ lb. Grain, by sail, for Cork and orders, at 5*s*.9*d*.@6*s*.6*d*. per quarter.

New York Live-Stock Markets.

RECEIPTS.

WEEK ENDING	*Beeves.*	*Cows.*	*Calves.*	*Sheep.*	*Swine.*	*Total.*
Dec. 18	8,358	143	940	24,227	35,124	68,792
Dec. 28	6,413	39	538	16,843	28,188	52,021
Jan. 1	7,514	73	664	10,248	17,641	36,140
Jan. 8	8,999	84	775	25,231	21,335	60,424
Total for 4 Weeks	31,284	339	2,917	76,549	106,288	217,377
do *for prev. 4 Weeks*	40,139	428	6,421	109,304	142,335	298,627

	Beeves.	*Cows.*	*Calves.*	*Sheep.*	*Swine.*
Average per Week	7,821	85	729	19,137	26,597
do. do. *last Month*	10,034	107	1,605	27,326	35,583
do. do. *prev's Month*	9,785	73	2,052	30,732	29,407

In reviewing the live stock trade for the year past, the most important feature is the rise and growth of the foreign export of beef and mutton. The experiment of shipping live animals resulted in failure, but that of exporting dressed carcasses has so far promised to result successfully. An unfortunate reverse in the market, by which a whole shipment was sacrificed at 2 cents a pound, making a loss of $20,000, has led the capitalists engaged in the business to become their own retailers, and open shops for the disposal of the meat. The final result has yet to be seen. 22,500 head in all have been shipped, and the weekly consignments now reach 1,000 head and upwards. Notwithstanding the withdrawal of this large quantity, the receipts of beeves have increased since last year. The total arrivals for 1876, have been as follows:

	Beeves.	*Cows.*	*Calves.*	*Sheep.*	*Hogs.*
Totals, 1876	477,276	8,976	125,594	1,247,820	1,262,171
Average	9,005	75	2,370	23,544	24,192
Totals, 1875	453,060	5,034	117,580	1,228,550	1,338,541
Average	8,743	97	2,261	23,626	26,702
Totals, 1870	356,026	5,050	116,457	1,463,878	839,625
Totals, 1860	226,747	7,154	40,162	514,191	319,628

Prices for the past year have averaged 1¼c. ₱ lb. less than in 1875, and the business on the whole has been satisfactory to none interested. The fluctuations have been from 8½@10¾, the closing price being 10¼c., against the opening price of 10c.

Beeves.—The market, under the help of retarded trains and lessened receipts, many fine holiday cattle, and a good demand, has ruled strong with higher prices through the month. A much greater advance would have been made, were it not for the large quantity of game and pork products, such as spare-ribs, tenderloins, etc., of which fully 1,500,000 pounds are thrown upon the market weekly. All this taking the place of beef in consumption, is equivalent to a reduced demand of at least 1,000 beeves weekly. The foreign trade, now taking about 1,000 head weekly, helps to sustain the market. At the close prices were a little weak, extra cattle selling at 10¾@11¼c. ₱ lb., estimating 58lbs. ₱ cwt. Good natives of 56 lbs. ₱ cwt., sold at 9½@10c., and Texans and Colorado cattle of 55 lbs. ₱ cwt., at 7¾@8¼c. ₱ lb.

The prices for the past four weeks were as follows:

WEEK ENDING	*Range.*	*Large Sales.*	*Aver.*
Dec. 18	9 @11 c.	7¾@12½c.	9¾c.
Dec. 25	8½@12 c.	9¼@11¾c.	10 c.
Jan. 1	8½@11¾c.	9¼@10¾c.	10 c.
Jan. 8	7¾@11¾c.	9¼@10¾c.	9¾c.

Cows have been in poor demand, and the market has been dull and slow through the month. Prices are ruling from $45 to $70 each; lots sold at averages of $60 and $65 ₱ head....**Calves.**—A poor demand for this stock has been met with a small supply, and prices have not suffered to any extent. Fat veals are worth 9¾@10c. ₱ lb.; ordinary calves bring 4@6½c., and hog dressed sell at 11@12c. for prime, and 12¾ for extra fat ones....**Sheep.**—Free arrivals have weakened the market to some extent, but no actual decline can be noted. The closing rates were 4¼c. ₱ lb., live weight, for thin sheep, 5¼@5¾ for medium, and 7@7¼c. for fat stock....**Swine.**—Irregular arrivals have caused a fluctuating market, prices having advanced and declined fully ¾c. ₱ lb. Prices ruled at the close at 8@8¾c. ₱ lb. for city dressed, and 7¾ for Western. Live hogs sold at 6¾ @6¾c. ₱ lb., for 200 to 220 lbs.

Prices of Feed.

Bran, per ton	$18.00@$20.00
Middlings, per ton	19.00@ 21.00
Ground Feed, per ton	15.00@ 21.00
Linseed-oil-cake, western, per ton	44.00@ 47.00
Cotton-seed-cake, per ton	25.50@ 40.00
Chandler's Scraps, per lb	3@ 4

Prices of Fertilizers.

No. 1. Peruv. Guano 10 p. ct. ammonia, standard, ₱ ton	$56.50
do. do. guaranteed, ₱ ton	56.00
do do. rectified, per ton	61.50
Mapes' Nitrogenized Superph osphate, per ton	40.00@ 50.00
" Plain Superphosphate (mineral), per ton	30.00@ 35.00
" Bone Superphosphate, per ton	40.00@ 45.00
" Prepared Fish Guano, per ton	35.00@ 40.00
Quinnipiac Fertilizer Co's. Phosphate, per ton	40.00
" " Dry ground Fish Guano, ton	45.00
" " Pine Island Guano, per ton	45.00
Stockbridge Corn Fertilizer	22.00
" Potato "	12.00
" Tobacco "	60.00
Fish Guano (crude in barrels), per ton	18.00
Bone Flour, per ton	40.00@ 45.00
Rawbones Ground (pure), per ton	33.00@ 40.00
German Potash Salts, (25@33 per cent), per ton	25.00@ 30.00
Gypsum, Nova Scotia, ground, per ton	8.00@ 9.00
Wood Ashes, per bushel	16 c.@18 c.
Nitrate of Potash (95 per cent.), per lb	9 c.@ 9¼c.
Sulphate of Potash (80 per cent) per lb	3½c.@ 4 c.
Chloride of Potass, (muriate of potash, 80p.c.), lb	2¾c.@ 3¾c.
Nitrate of Soda, per lb	4¾c.@ 5 c.
Sulphate of Ammonia (25 per cent.), per lb	5 c.@ 5½c.
Dried Blood or Dried Meat per unit of ammonia	$3.00@ $ 4.0.

Change in Subscription Terms.

Though, in a dozen years past, no change has been made in the nominal subscription terms of the *American Agriculturist*, except to add the postage when prepaid here, yet the price has been really *greatly lessened* by the additional quantity and quality, for the same price. Those giving special attention to such matters must have seen a large increase required in the amount expended for engravings, for quality of paper, and printing (and cover), for gathering and preparing information, etc. Any one making a comparison of this journal with most similar publications, must have noted the attention given to securing the best writers of the country, to sifting and condensing articles, etc. It costs far more to sift out and reject, to investigate new plants, implements, etc., than it would to send to the printer a mass of ill-prepared, uncondensed, floating material, with extracts from other journals, good, bad, and indifferent. Very many thousands of dollars are devoted to artists, designers and engravers. *Good* engravings convey, in small space, directly to the eye and mind, much information, that would require many columns of unsatisfactory descriptive words. Finely cut, original engravings, in the careful engraving and printing required, are far more expensive than the ordinary coarse "ink daubs," and they are worth far more in being pleasing to the eye, as well as in cultivating the taste. The printed matter of this paper costs for gathering and preparing, *before it goes to the printer*, over $20,000 a year, the benefit of which is enjoyed by every reader. This is a larger sum than is expended upon most of the $3 and $4 Magazines. The subscribers are not charged with or asked to pay the bare cost of preparing and supplying the paper, but a considerable part of this is paid by advertisers. The Publishers would gladly furnish the paper even lower if possible, to promote its still wider diffusion. In large clubs it now nets only $1 a year, as 10 cents is paid to the P. O. Department on every subscription. The single rate $1.60 (that is $1.50 and postage) is *very low* when quality and expense are taken into account. (The paper is strong, sized and calendered, almost equal in quality and finish to good writing paper). Reductions to clubs are made on the wholesale principle, and because it costs less to send to a club.

On and after Feb. 5th, 1877, the subscription terms of the *American Agriculturist*, payable in advance, will be:

1 copy, 1 year, sent post-paid.....	$1.60 each.
2 copies, " " "	$3.00, or $1.50 each.
3 " " " "	$4.20, or $1.40 each.
4 " " " "	$5.20, or $1.30 each.
5 to 9 copies " "	$1.25 each.
10 to 19 copies " "	$1.20 each.
20 copies and upward "	$1.10 each.

(When delivered in N. Y. City, through P. O., 14 cents extra on each of the above rates.)

containing a great variety of Items, including many good Hints and Suggestions which we throw into smaller type and condensed form, for want of room elsewhere.

☞ **N.B.—The Postage Law.**—The present postal law **requires pre-payment of postage by the publishers.** Each subscriber must therefore remit, in addition to the regular rates, **ten cents for prepayment of yearly postage by the Publishers, at New York.** Every subscriber, whether coming singly, or in clubs at club rates, will be particular to send to this office postage as above, *with his subscription.* Subscribers in British America will continue to send postage as heretofore, for pre-payment here.

Remitting Money: — Checks on New York City Banks or Bankers are best for large sums; make payable to the order of **Orange Judd Company. Post-Office Money Orders** for $50 or less, are cheap and safe also. When these are not obtainable, **register** letters, affixing stamps for postage and registry; put in the money and seal the letter in the presence of the postmaster, and *take his receipt for it.* Money sent in the above three methods is safe against loss.

Bound Copies of Volume Thirty-five are now ready. Price, $2, at our office; or $2.50 each, if sent by mail. Any of the last twenty volumes (16 to 35) will also be forwarded at same price. Sets of numbers sent to our office will be neatly bound in our regular style, at 75 cents per vol. (50 cents extra, if returned by mail.) Missing numbers supplied at 12 cents each.

CLUBS—Increasing: Advantages: Lower terms are given to clubs of four or more subscribers, partly because it costs less to mail in packages, with only name slips on each paper; and partly to encourage getting up large lists. We do not object to a person's adding names to his club from other post-offices, because such additions usually become centers of other clubs....A Club can at any time be increased by the addition of other names, if these start with the same date as the others....Any one having sent a small club at one price, may raise the club to a large figure, and lower rate for all. Thus: one having sent 4 names at $5.20, may send 6 names more for $6.80, making $12 for the whole 10, including postage. And so for other club rates. The Terms are: Single subscriptions $1.60 each; two names $1.50 each; three names $1.40 each; ten to nineteen names $1.20 each; twenty names and upwards $1.10 each. Postage always pre-paid by the Publishers..... Premium clubs may be gathered at any number of post-offices, if all are sent in by the same person.

Study the Advertising Columns.—We often take up a daily or weekly newspaper and carefully read all the Advertisements through, and never do this without getting some useful information. One learns what business is being done, and how it is done—what is for sale, and by whom. *Our* business columns are of especial value, because of the care taken to exclude all advertisements from parties not believed to be honest. We mean to advertise for no parties who have not both the ability and intention to do all they promise. In order to please advertisers, we repeat the request that those sending orders, or for circulars, etc., to our patrons, will mention *where* the advertisements were seen. We also like to have advertisers thus get some idea of the large number of intelligent and enterprising people they find among our readers.

Only $3, will secure **TWO COPIES,** of this Journal, sent post-paid for all of 1877. See New Terms given in first column.

Every German Cultivator and Laborer on the Farm, or in the Garden, OUGHT to have the German edition of the *American Agriculturist.* It contains not only the Engravings, and all the essential reading matter of the American edition, but an additional *Special German Department*, edited by the Hon. Frederick Münch, of Missouri, a skillful and successful cultivator and excellent writer. No other German Agricultural or Horticultural Journal in America has been so long issued; no other one contains so much useful information, or a tithe of its engravings. The Germans are a reading, thinking people, and know how to make good use of what they read. Many Americans supply it to their German laborers and gardeners, and all would find it pay to do so.—Nothing else can compete with it in cheapness of price for the same amount of material, engravings, etc., because the expense of collecting and making these is largely borne by the American edition, and no separate office or machinery is required beyond a couple of German editors and the printers. Its terms are the same as the American edition, singly and in clubs; and clubs can be composed of subscribers for either edition in whole, or in part.—☞ Please call the attention of your German neighbors to this paper. It will do much to help new comers to a knowledge of the system and modes of culture used in this country.

Florida Paper and Map.—The Florida New Yorker, edited by J. B. Oliver, is a journal published in New York, with a view to facilitate emigration to Florida, and to afford information with regard to that State. The numbers we have examined are remarkably free from exaggerated statements, and it appears to be conducted with fairness as well as ability. The publishers send us "Apthorp's standard Map of Florida," which we at first thought was a reproduction of the U. S. Land Office Map, but a comparison shows it to be on a larger scale and more distinct, hence better for general use than that, which we have considered the most perfect map of the State. Price, in book form $1.25.

Drill for Turnips and Beets.—"T. G.," Kittrels, N. C. We recently illustrated one of the best double-row horse drills for sowing seeds of roots. It is made by Watson & Co., of Ayr, Ontario, Can.

Cheese Factories.—"L. B. P.," Clay Co., Ill. An illustrated article giving many particulars about cheese factories, and utensils employed therein was given in the *American Agriculturist* for April 1874.

Carrots for Stock.—"R. J. H.," Centerville, Iowa. A peck of cut carrots will make a feed for a horse or a cow. They are very healthful for horses, and tend to keep their skins loose and the hair smooth.

Grasshoppers in Kansas.—"Geo. F.," Essex Co., Ont. Canada. The Arkansas valley has been visited by the locusts, but since the year 1875 they have done no damage worth mentioning. In that year it was only the poorer settlers, who had no other resource than their sod corn, who suffered seriously. The locusts are not dreaded in that part of the State, as they come, when they do appear, at a season when the crops are safe. Last year they ate off the newly sown wheat in scattered places, and made it necessary to resow the fields. This was the worst of their visits last year.

"Diseases of Domestic Poultry. How to Avoid and Cure Them," is the title of a work by Geo. P. Burnham, well known as an author of books on poultry. As in the title, the avoidance is placed before the curing, so in the book he sensibly gives prominence to prevention rather than medication. Indeed, where the one is thoroughly understood and practiced, there will be but little need of the other. The demand for a work on poultry diseases is here met by a pamphlet of 50 8vo. pages, which tells about all that can be said on the subject. Sent from this office for the price, 50 cents.

Tree Labels.—Among the various labels now offered to nurserymen and others, none seem so permanent as those made by Mr. J. E. Woodhead, Chicago, Ill. They consist of slips of zinc, with the name of the variety plainly and permanently stamped in the metal. Of course this cannot be effaced, and so long as the label remains the name will be legible.

Record of a Jersey Cow in California.—"S. B. L.," Alameda Co., Cal., states that "Virtue 2d," dropped 7th, Aug., 1874, on importation of her dam, and calving 13th March, 1876, gave 42 quarts of milk in seven days, from 15th to 22nd of November, following. This milk made 5 lbs. of butter. The feed was lucern pasture and cut hay, with 3 quarts of bran daily.

Estimating Weight by Measure.—"W. E. B.," Sykesville, N. Y. There are no trustworthy rules by which an inexperienced person can arrive at the weight of "hogs, cattle, and other animals by measurement." Those used to handling stock can make very good guesses by the help of a tape line and some methods of estimating; but the result depends upon the kind and condition of the cattle.

Sorento and Inlaid Work, by Arthur Hope; Chicago, John Williamson. A beautiful book for amateurs in sawed work, now so popular, giving useful directions and numerous full-sized and tasteful designs. Price, $1.50.

How many Cubic Feet of Hay in a Ton.—"H." No exact rule can be given for measuring hay in bulk. It depends upon the kind of hay, the condition in which it was when cut, the size of the stack or mow, and how long the hay has been packed. As a rough guess 500 cubic feet of timothy, and clover, or 700 feet of clover alone, or meadow hay, may be taken as a ton.

Fall and Spring Barley.—"A. G.," Rockbridge, Va. Barley is not nearly so tender a crop as is generally supposed. It has been found to stand the winter very well in the milder parts of England, and to spread and tiller very much through the long season of growth. This fall sown barley is the same as the spring sown, the same kind of seed being used for both sowings. Whether this grain would stand a severe winter in so mild a climate as Virginia, or not, is questionable, but this should be tried. There would be no danger further south, where a great yield of early spring fodder might thus be grown.

FEBRUARY is a GOOD MONTH, for any one to secure *free of cost*, one or several of very good, desirable useful articles, offered in our premium lists, (page 73). Individuals can well do this on their own account. Many have thus, during February alone, secured various Farm and House implements, Pianos, and a multitude of lower cost articles.—It is a good month for a company of farmers, or a Farmers' Club, to put their efforts together and make up a list of subscribers, that will secure *free* one of the Agriculturist Libraries, named in the premium lists, to be used by all the members, or neighbors. Thus: 18 subscribers, easily collected by half a dozen persons, (3 each), will secure a **$10** Library of the best books, (your own selection). Or 31 names, (5 each), will get a **$20** Library, and so on. Such Libraries are a public benefit, and many places have got them in years past, through our premium offers. Let every farming neighborhood try it this month.

DON'T FAIL

To Secure one of the

GOOD THINGS OFFERED

On Page 73, and send to the Publishers for an Illustrated List of Premiums if you have not already received it.

Fruiting the Akebia.—The "American Naturalist," in reporting the proceedings of the Academy of Natural Sciences, Philadelphia, has the following: "Mr. Meehan spoke of the *Akebia quinata*, an indigenous plant of Japan, where it bears fruit, although it had not been known to do so in this country until recently, when the fruit had been produced by a vine cultivated by Mr. Canby, of Wilmington, Del."—We know that our friend Meehan studies the *American Agriculturist* faithfully, but in this case his memory is at fault. The *Akebia* fruited in Westchester Co., N. Y., in 1868, and the fruit was figured in the *American Agriculturist* for January, 1869. Still the fruiting is of so rare occurrence that it is worth while to record it, and it gives us an opportunity to again call attention to the merits of this most excellent hardy climbing vine.

"Game Grass."—"G." Philadelphia. We know of no grass called "Game-grass" in West Tennessee or elsewhere. Several grasses are called *grama* and *gama*. Please get us a specimen.

Fine Double Chinese Primroses.—Mr. John Saul, Washington, D. C., who has been remarkably successful with Chinese Primroses, sends us specimens of some of his new seedlings. We have seen nothing to approach these in size of truss and of individual flowers, or in doubleness. The white is without a tinge of green, and the colored ones are of the most delicate tints imaginable. We congratulate Mr. Saul on his success, and add as a practical hint that Chinese Primroses are most satisfactory window plants, *provided* the amateur starts early, and gets his plants before they have been subjected to greenhouse culture. Plants that have formed their buds in the greenhouse, will rarely flower if transferred to an ordinary room, but if taken early in the season, they will bloom finely.

"The Lord's Land."—Three years ago, while spending a few weeks in Naples, Italy, we were agreeably surprised one winter morning, by the arrival of a goodly company of acquaintances and friends from America, on their way for an extended tour from Suez through the Sinaitic Wilderness, and on through Palestine, in various journeyings to and fro, up to the northern boundary. Among these tourists were James Strong, S.T.D., author of Harmony of the Scriptures, etc., etc., Rev. Dr. Ridgeway, and others, including engineers, photographers, etc. After doing Vesuvius, Pompeii, Naples and vicinity, we bid them God-speed as they sailed away on a stormy day for Alexandria.....Before us is one of the results of that journey--a large, beautiful volume with the above title, from the pen of Dr. Ridgeway, very copiously illustrated with 114 engravings and maps, and full of interesting descriptions of the country, incidents of travel, habits of the people, etc., etc. It is one of the most instructive as well as entertaining works on the entire Bible Lands that we have ever read. Published by Nelson & Phillips, 805 Broadway, New York. 744 octavo pages.

Value of Corn-Bran.—"G. W. B.," Phenix, R. I. We do not know precisely what is the feeding value of corn-bran, as compared with wheat-bran, but it is certainly much inferior to that. We should not wish to give more than 25 cents a hundred pounds for it, at which price it might pay to use it as food for hogs.

Foaming of the Cream.—"Subscriber," Alleghany Co., Pa. The foaming of cream in the churn is generally due to a too high temperature. To reduce it, turn ice cold water into the churn, let the cream stand a short time, and then go on with the churning.

Forage Plants—Durra.—Green forage plants are receiving more attention from our farmers than ever before; we last month gave an account of a new introduction, the Prickly Comfrey; this month we call attention to the merits of Durra, which, though old as a grain plant, has recently come forward as a forage plant, and we have at least two more little known plants to describe, for which great claims are made. We present these plants as matters of news, giving such information as can be procured, and leave our readers to judge whether it is desirable or not to experiment with them. In considering the value of different forage plants, it must be borne in mind that productiveness is not the only desirable quality, and that there is a difference of the nutritive value of different kinds of foliage, as there is in different grains and roots. A plant that produces three tons of green fodder to the acre, may be really more valuable than one yielding five tons. In our description of Durra on pages 59 and 60, there was not room to mention the nutritive value of its foliage. It is well known that the value of a food depends upon the amount of carbo-hydrates—fat and heat producers, and albuminoids—the flesh forming principles. The German chemists, Wolff and Knop, who appear to have analyzed every green thing used, or likely to be used, as forage, give an analysis of Durra, under its botanical name, *Sorghum vulgare*. A comparison with our most important forage crop, Indian corn, also their analysis, stands as follows:

	Carbo-hydrates.	*Albuminoids.*
Indian corn, leaves	10.9	1.1
Durra, leaves	11.9	2.9

From this it appears that Durra is somewhat superior to Indian corn in its fat-forming elements, it is more than twice as rich in its flesh-forming constituents.

Farmer's Clubs.—"Volinia (Mich.) Farmer's Club," send their programme for 1877, which suggests some matters that may be of use to other clubs. The list of officers, and the whole programme for the year, is printed on a postal card. This is an economical hit which perhaps the officers of other clubs have not thought of. It goes to each member, and is in a convenient form to preserve in a pocket-book or elsewhere. The subject to be discussed at each meeting of the year is given. This shows wise forethought. We notice that one subject is the "Improvement of Highways." This should be on the programme of every club in the country. The roads in many sections are a public disgrace, and we hope that general discussion will lead to corresponding action.

Potato Puff.—Any left over mashed potatoes may be made into an excellent dish for next day's dinner. Mashed potato, 2 cupfuls; melted butter 2 tablespoonfuls, work well together and add milk, 1 cupful, and 2 well-beaten eggs. If the potato was not sufficiently seasoned for the table salt will be required. Bake in a quick oven until the top is a light brown.

Brown Bread.—Several have asked for a recipe for this celebrated New England bread, which is often called Boston brown bread. The following has been thoroughly tested and approved. Indian and rye meal, one quart each. Milk, 3 pints; soda and salt, two teaspoonfuls each; molasses, ¾ of a cupful. Steam for five hours, at the end of which time set the pan in a hot oven long enough to well brown the crust.

Cotswolds for Rhode Island.—Eight ewes and one ram of the flock sent to the Centennial from the Royal Agricultural College, Cirencester, Eng., were purchased by Dr. H. M. Howe, and placed on his farm on Hogg Island. The islands of Narragansett Bay are celebrated for the excellence of the mutton produced on them, and these fine sheep could have no better locality in which to develop their best qualities than here.

The Popular Health Almanac for 1877, by F. Hoffmann, and published by E. Steiger, N. Y. So many almanacs are published in the interest of quack medicines, that it is gratifying to find one which has for one of its objects battling "unsparingl against that insidious foe to health—the patent medicine humbug, a disgraceful and dangerous trade, conceived in fraud, and leading to disaster." Besides the almanac proper, there are useful tables, and much condensed and useful information on health topics. Analyses are given of a number of the popular nostrums. We wish this little work a large sale. It costs only 10 cents, and should be in every family in the land.

The One Hundred Days Tomato.—This variety was sent out last year by Mr. J. A. Foote, seedsman, Terre Haute, Ind. We had the seeds from him last year, raised the plants, and set them out with several other new kinds. The almost unprecedented dronth so checked and dwarfed our early plantings, that we had nothing like a trial of this or any other new sort, and we can only report what others say of it. Several well known cultivators in the Western States give very positive testimony as to its earliness and productiveness, and confirm Mr. Foote's moderate claim that it is one or two weeks earlier than any other. We hope to be able to give a better account of it another season.

Swivel Plows.—"M. H.," Bayfield, Wis. Swivel plows, those which turn so that a hillside can be plowed, or that flat land can be plowed, without making lands, or going around the field, are made by several manufacturers. The Higganum Plow Co., of Higganum, Ct., make a very good one; the Ames Plow Co., Beekman st., New York, also make a good swivel plow. By writing to these parties, a circular may be procured.

Draining Plow.—"M. H.," Bayfield, Wis. A ditching or draining plow with a share shaped something like an egg, and fastened to a thin strong standard, is often used for making drains. It leaves a round hole or space in the ground, similar to a mole's burrow, for which reason it is called a "mole plow." They are most useful in clay soils.

Sundry Humbugs

Some months ago we congratulated our readers on the probability that, in future, they would not be annoyed by the receipt of so many lottery and other fraudulent schemes, as heretofore. We based our hopes upon the law passed at the last session of Congress, or rather the additions to a former law, which we supposed, as no doubt did the law makers, would effectually debar the swindlers from the use of the mails. While some of the smaller fry have been frightened off, the larger operators keep on, and their circulars continue to be carried by the United States Mail, in spite of the fact that the law forbids. In one of our interviews with the Post-office officials, in whose province such matters come, this lottery business was thoroughly discussed. These lottery swindlers have often been prosecuted, but never convicted; they have a plenty of money, which they make easily, and spend freely, and they engage the most acute and ingenious lawyers, and stand up and fight. The trouble is in the law itself, which is so defective--we need not point out to other swindlers where—that a sharp lawyer can "quash" any indictment found under it. "Why not amend the law?"—it will be asked. We are very sure that this will be done, but until it is, the law is of little value. We can assure our readers that this immunity enjoyed by these lottery and other swindlers, is not due to official indifference. Whatever may be the case with some public officers, those of what we may call the criminal Department of the Post-office, whether especially attached to the New York Post-office—by far the largest in the country—or those whose powers extend to all the post-offices in the country—are thoroughly in earnest; they not only accept the enforcement of the law as a duty, but are really desirous of doing all in their power to protect the community against the designs of swindlers of every grade.

THE WYOMING LOTTERY

has turned up in a new place, and a new game is being played. It is pretended that in settling up the affairs of The Topeka and Laramie Lotteries, there were $47,000 in unclaimed prizes, and that the "Supreme Court" (oh!) decided that the managers shouldn't have this snug little sum, but that the "Finance Committees" (oh yes!) should invest the money in useful prizes, and make another lottery. This is gravely set forth in clear type on handsome paper, and there are people who actually believe it. Well, the "Finance Committee" remove the remains of the defunct Kansas and Wyoming lotteries, "body, boots, and breeches," to New York City. Circulars go hence to numerous people, informing them that the "supplementary drawing" has been held, that the recipient has drawn a gold watch valued at $200, which can be had by paying the committee their "assessment" of $20. The mere statement of this scheme should be sufficient. Yet there are persons receiving these circulars, who write to us and ask us to go and get the aforesaid watch for them, and get back our $20 by selling the watch! Here we have been exposing humbugs all these years, and are expected to go and deal with the defunct remains of one of the biggest humbugs of the day. Excuse us! If any one supposes that the Wyoming lottery is dead while Pattee still lives, he has small knowledge of the nature of things. It still waves its banners, but they are now inscribed

"THE CHEYENNE STATE LOTTERY."

The blade may be lost and replaced, and the handle a new one, but it is the same old knife. The same genius who devised the "special terms to agents" in the Laramie affair, is manifest here. Poor Wyoming, were not the grass-hoppers enough? We can only hope to warn the unsuspecting; the regular lottery gambler is beyond

our reach, and to those tempted to "try their luck" for the first time, we say *don't*. No greater curse can befall a young man than to draw a prize... In former numbers we have shown the various methods resorted to for

PROCURING NAMES,

especially of young persons. In so many cases have these been solely in the interest of wrong doers, or of those who procure lists for sale to any who will purchase them, that every scheme having the collection of names, as its object, must be looked upon with suspicion. A circular has recently been sent to post-masters and others, asking them to furnish the "names and correct post-office address of all the young people in your knowledge."—Accompanying this are blanks to be filled out with the names of young men between the ages of 17 and 30, and of "all the ladies in your knowledge between the ages of 20 and 45."—This is done under the plea of sending some publication about the Centennial Exhibition, but just *what* we do not make out from the circular. We have this matter under investigation—if it is a straight-forward affair, the projectors are unfortunate in adopting the methods of those whose ways are dark..... Quite the freshest thing in the way of a humbug, are the

TEXAS LAND SCHEMES.

The "Ohio, Kentucky & Texas Land Co.," lead off the procession that starts in the second century of the nation. They have somehow succeeded in placing their advertisement, and a very taking one, in papers usually regarded as respectable. They give lots away in "Mineral City," i. e., only charge a dollar for the deed. Allowing that the deeds cost 5c. or even 10c, to get up, it returns a good profit. They only "give away" (for $1) every other lot, but 25 x 100 feet in such a wonderful place as Mineral City, is but a provocation, and one will naturally want more, and we hear that some have *purchased* several lots. From the number that have written us in regard to this scheme, and the earnest character of the letters, we infer that the thing has taken like wild-fire, and the dollars have rolled in in a stream. We expect to see, before many years, Texas receive a large influx of settlers. There may be finer spots on the face of this earth than some parts of that wonderful State, but we have not seen them. Every fraudulent scheme of this kind hurts the State; the Texas people feel this, and are indignant that this Land Co. should assume their name to carry on a swindle. The Texas papers denounce it, and Mr. Dickerman, the Clerk of Grayson Co., Texas, where "Mineral City" is said to be, comes out with a very positive statement. He says "Mineral City has no existence, in fact. There is not a house on the ground, and no matter what may be said to the contrary, it has never been surveyed and staked off." He takes up the assertions of the Company, and instead of calling them misstatements, he uses a stronger word; thus: "The Company represent that their title is good, this is lie No. 1," and so on to "lie No. 6," and winds up by saying: "The whole thing is a humbug from beginning to end, and the company has persistently, by all manner of misrepresentations, misled many people to their hurt." The Sherman (Texas) "Weekly Register," publishes Mr. Dickerman's letter "In the hope that it may meet the eyes of some one who might otherwise be swindled by this monstrous frand." So ready are people to catch at whatever scheme promises something for nothing, that they do not examine to see where the cat is under the meal, but "go it blind." It is estimated that this "Company" have "given away" over 100,000 lots at $1 for the deed. Allowing the expenses for advertising, etc., to be $25,000, it is a large haul. Other projects relating to Texas of a doubtful character are advertised. Look out!....It is well to start fresh in this new year of the new century. We have here

A NEW SYSTEM OF HEALTH.

The old style of health was well enough in its day, but the world has gone on improving. If Franklin, Jefferson, and the rest of the fathers had only known of it they might have lived until now; they tried some of the old "pathies" and died, but then

VITAPATHY.

hadn't been patented—or what is the same thing "copyrighted." We have here just the funniest little book that ever was put into a bright red cover. It is all about "Vitapathy," which originated by "Prof. J. B. Campbell, M. D. V. D." Whether "V. D." means "Veterinary Doctor," or what, we don't know, but we do know that the "system of practice is copyrighted," though just how it can be done we don't know. It starts off thus:

"VITA—Life, PATHY—disease.

Vitality cures disease. Life overcomes death."—Which nobody can deny.—Like butting ones head against a stone wall, it's so convincing. But let us read: "Vitapathy ascertains and teaches what is matter, its relation to spirit or life; its relation to all things, and how all things are formed out of it, and how material organisms are generated, built up and sustained." There now, "If you don't see anything you want, ask for it." That description of Vitapathy no doubt makes you think it has taken a pretty big contract—but that's nothing. Besides telling everything about everything, it does ever so much more. Nothing small about it—good measure at this shop. It teaches "how to develope the intellect, increase mentality, and expand the powers of the human soul to the most unlimited extent." Pretty good that, but it is nothing to what follows. "Vitapathy teaches a correct system of Psychology or science of the soul, and the power of soul over body, by which we can control ourselves and others—control patients, friends and lovers; in short, control everything and overcome the world."—There! We are glad the thing is "copyrighted," for it would be mighty dangerous to have it around loose! How wonderful, what power! do everything, overcome everything, control everything.—How richer than Stewart, Astor, Vanderbilt, and James Lick, all in one! Yet with it all Campbell can't "control" that stomach of his, he can't "overcome" zero weather in place of an overcoat, so to get something to eat and to wear—which he needs just like the rest of us, who don't Vitapath a bit, he sells Hearing Trumpets, Inhalers, Electric Apparatus, all for thrashy dollars, and also runs a college to teach his "copyrighted" system of quackery, and even issues "diplomas" to the fools who will pay for them and the "right to practice." We should like to know what kind of laws they have in Ohio, where a humbug like this can issue "diplomas"....We do not know who carries off the palm, Campbell with his Vitapathy or Mrs. Brown with her

METAPHYSICAL DISCOVERY.

Those who have regarded metaphysics as something intangible are mistaken, for Mrs. B. sells it by the bottle—to be sure at a round price, but it can be bought in the liquid form with a discount to the trade. And there is no beating around the bush with Mrs. B. "This great discovery kills the root of all disease"—which we submit is bad for the disease. The matter is brought down to a very fine point: "The sinewy nerves with the world of mystery in the human body, all partake of the three moistures, as every part and parcel of the ground, the trees, the roots, the branches, the leaves, all partake of the moisture—Dew, Rain, Frost and Snow by absorption."—Tyndall where are your "Forms of Water," now? It is all a very serious thought that "nine tenths of the children perish for the want of this three-fold moisture." Sad as is the subject Mrs. B. will have her little pleasantry. We read: "*Unsound flesh* becomes—through *Cold* and *Fever*—MORTAR. This mortar stops the wheels of the mortal machine,"—Oh Mrs. B., how could you! mortar stopping the mortal machine is too bad. However, if we would'nt shuffle off this mortal coil, we must slap on the methaphysic stuff, "which enters the system through the organs of the Head, Eyes, Ears and Scalp." She tells us that "the TEETH are shrubs, with roots far down in the earth; which demand moisture—as a necessity." That clearly accounts for the perennial drouth that we have noticed in some people. The funniest part of it all is that like the Vitapathic man, Mrs. B. has a Metaphysical University—something we never met-afore, though we doubt if any one ever met-a-physician in it.

Change in Seed-Firm.—Our many readers in Australia are informed that the extensive seed business formerly carried on at Sydney, N. S. Wales, by Anderson, Hall & Co., will be hereafter continued by the senior partner, Geo. Anderson.

"Fragariculture," is the title of a work on strawberry culture, by Felix Gillet, Nevada City, Cal. Mr. G. has raised several new varieties. This work gives his method of cultivation, and is illustrated by photographs of his own and other berries; 32 pages; price from 50c. to $1.25, according to number of photographs.

Boston Cream Cakes.—Several recipes have been asked for by our friends, and there not being room for them in the Household Department, they are given here. Cream cakes, as they are called in Boston, and "Cream Puffs" elsewhere, are remarkably popular in the modern Athens. The following recipe is from a friend who is very successful with it. Take of flour, sifted, 8 oz.; butter, 4 oz.; sugar, a teaspoonful. Rub together thoroughly and put these into a pint of boiling water, boil and stir briskly until it thickens; remove from the fire and add gradually 8 eggs, well beaten, and stir rapidly; when thoroughly mixed, let stand until cold. Have buttered tins ready, and drop this mixture in tablespoonfuls, about 6 inches apart, brush over with white of egg, and bake in a quick oven to a light brown color. When done these will be hollow shells which are to be cut open on one side and filled with the "cream," which is really a custard, to make which: beat two eggs to a froth, add half a teacupful of powdered sugar and then half a teacupful of flour; stir all into a pint of boiling milk, and cook until it thickens. When cool, flavor with lemon or other extract, and fill into the puffs or shells.

To be had without Money.—

There will be found upon our Premium List (see page 73) a large number of most useful and valuable articles, all of which are new and of the best manufacture, and any of which can be obtained *without money* and with but little *well directed effort*. Among these are: **Beautiful Silver and Gold-Plated Articles—Magic Bell-Head and Charm Pencils and Gold Pens—Fine Table Cutlery—Pocket Knives—Children's Carriages and Toys—Swings—Clocks—Table Croquet—Pianos—Microscopes—Watches—Guns—Sewing and Washing Machines—Books, etc., etc.**—Read all of page 73, and see how easy you can obtain one or more of these good and desirable articles.

The Illustrated Annual Register of Rural Affairs, for 1877, by John J. Thomas, Albany, Luther Tucker & Sons. If Mr. Thomas would only give us a poor number of this Annual it would be a help, but it is very monotonous, year after year, to say that each issue is as good as its predecessor. Each number contains much useful matter, and a set—now 23 numbers, is a cyclopædia of rural affairs. Sent from this office, postpaid, for 30c.

Soap Manufacturers Refuse.—"G. W. B.," Reading, Pa. Soap manufacturers refuse contains sufficient potash and other fertilizing matters, to make it worth hauling five miles. As it is liquid, it should be handled in barrels and used in making compost heaps along with manure, swamp muck, earth or other absorbents. It may also be treated in the manner described in January, for using night soil.

Sausage Meat.—"Mrs. S. M. W." We have used the following recipe for the last 12 or 15 years, and have been so well satisfied with it that we have not cared to try any other. For 100 lbs. of meat, use 40 oz. of salt and 8 oz. each of black pepper and sage; those who like more seasoning can increase these to 10 oz. We keep the meat in two ways: Make bags of common cotton cloth about a foot long, and of a diameter proper for a sausage cake, and fill them with the meat, tie closely, and hang in a cold place. When wanted for use, cut slices from the roll and fry. Another portion is made into cakes and cooked as for the table; these are placed in a stone jar in layers, but do not touch the sides; then pour over the cakes the fat that comes from them in cooking, to which enough lard has been added to completely cover them. They only need to be warmed through. We have kept them in excellent condition until May.

Croquettes.—Because of their French name, and of the high-price charged at restaurants, many have the impression that they are far too expensive for ordinary families. This a mistake, as they afford a most acceptable form in which to use up the remnants of fowl, game, meats, etc. When presentable bits can no longer be cut from a turkey, chicken, or other bird, or there are the remnants of veal, mutton, venison, or even fish, an excellent breakfast or supper dish may be made. The material is to be chopped fine; one-half to one-fourth as much bread crumbs or mashed potato, a well-beaten egg to each cupful of the mixture, to bind it together, and if too dry make into balls, add gravy, or if none is at hand melted butter, salt, pepper, and whatever seasoning may be fancied, such as parsley and other herbs; a trifle of onion, catsup, etc. Make into rolls, balls, or mold in a wine-glass. Dip in egg, roll in powdered cracker, and fry, having the fat *very* hot, to a light brown. Properly made they will take up no fat. Some omit the egg and cracker on the outside, and simply flour them. They may be cooked in advance, and warmed through when wanted by placing in an oven. Scraps of several meats may be combined, and a little ham will greatly improve the flavor of those made of veal.

The Scholar's Book of Household Management and Cookery, by W. B. Tegetmeier, New York and London, MacMillan & Co. As this work was written at the request of the School Board for London, we infer that it is to be used in schools. At all events it treats of the principles of domestic economy in a plain and sensible manner, and at the end gives the recipes used at the "National Training School of Cookery." Price 50c.

The Botanic Garden and Arnold Arboretum.—Both the Botanic Garden at Cambridge and the Arnold Arboretum at Jamaica Plain, Mass., are under the government of Harvard University, and Prof.

Chas. S. Sargent is Director of both. His report for the year ending in August last is at hand, by which we learn that essential improvements have been made in the Garden, and that the Arboretum is increasing in importance. It was characteristic of the excellent James Arnold that he should provide in his will for an arboretum, which, when established, will be of national importance and usefulness, and most fortunate for the bequest and the public, that in its most important stage, the formative, the arboretum should be in the hands of one who so combines enthusiasm and executive ability with competent knowledge as does Prof. Sargent.

The Jerusalem Artichoke.—In an item upon the native country of this plant, published last month, we asked for any information in regard to its use by the aborigines. Hon. W. C. Flagg, Moro, Ill., whose lore is not solely pomological, calls our attention to the fact that Palfrey, in his History of New England, vol. 1, p. 27, says that the Indians raised "a species of sunflower whose esculent tuberous root resembled the artichoke in taste." This certainly looks as if the plant was known to the red men, but there is room for more evidence.

The Death of E. G. Henderson.—Mr. Edward George Henderson, founder of the widely known horticultural firm of E. G. Henderson & Sons, Wellington Road, London, Eng., died on Nov. 4th, last, at the advanced age of 94. He had not taken an active part in business for 12 years.

Basket Items continued on page 73.

Bee Notes for February.

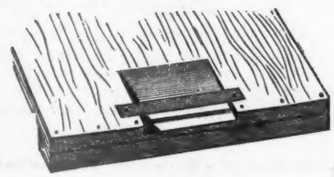
BY L. C. ROOT, MOHAWK, N. Y.

Bees, that are wintered in doors, should be left entirely undisturbed during the present month. Those wintered on summer stands should be examined, and if dead bees have fallen before the entrance, they should be removed. During fair days remove the roofs to allow the sun to shine directly upon the hives. If the new Quinby hive is used, remove the lid to let the sun shine upon the packing, and the inside of the lid, and dry out all the moisture. In preparing caps for any kind of hive, which are to be packed with straw or chaff, and placed over the hive when left on the summer stands to winter, it would be well to have the top of the cap loose, so that it may be removed, and the sun allowed to shine in and dry up the moisture. In handling hives for any purpose, at this season, let every movement be made with the *greatest care*, to avoid as much as possible disturbing the bees.

Judging from present indications, bees may be expected to winter well; the honey contained in the hive seems to be of superior quality. On the first of Jan. I weighed several hives that had been weighed the first of Dec'r. Four hives in my bee-cellar, where the temperature was from 46° to 48°, had consumed as follows: the first ¼ lb, another ½ lb, and two others one lb each. A hive left on a summer stand had consumed a little over two lbs. I propose to give the amount consumed by these swarms monthly, as well as the condition of the same in the spring, that the readers of Bee Notes may receive the benefit—so far as this single instance may go—of these observations on the two methods of wintering bees.

Entrances to Hives.

From some descriptions given by the late M. Quinby, of the entrance to his standing frame hive, several inquirers seem to have received a wrong impression. It will readily be understood that with the hanging frame, which hangs inside of a hive, with a space between each



ENRTRANCE TO HIVE.

pair of frames, as well as between the ends of the frames and front of the hive, and between the bottom of the frames and the bottom board, that the entrance may be cut in the bottom of the hive, or a hole bored anywhere in the end of the hive for bees to enter, the same as may be done in a common box hive. With the new Quinby frame, where one frame sets directly against another, and all rest upon the bottom board, the bees must enter the hive through an entrance under the frames. This entrance, as shown in the engraving, is made by cutting a passage in the bottom board, about half an inch deep at the front edge, and slanting gradually up and back for about four inches to the level of the bottom board. A piece of hoop-iron is nailed across this opening, on which the ends of the frames may rest. This entrance should never be deep enough to allow a mouse to enter. The width should vary at different times during the season. If it should be open the entire width of the frames, during the busiest season, it would be advantageous. With this in view, the entrance should be made wide, with means provided to contract the same, even to one-quarter of an inch if necessary.

Questions and Answers.

TIPPING HIVES.—"Do you tip hives forward to slant the bottom board to the front?"—When swarms are first hived, in an empty movable frame hive, with frames running from front to rear, if the hive is tipped to the front, it will aid in securing straight combs. As soon as the combs are properly started, and before it is desired to put honey boxes in place, the hive should be set level. For no other reason do I consider it desirable to set hives other than level, while there are many reasons why they should be level.

DIRECTION OF COMBS.—Will it make any difference in the prosperity of a colony whether the combs run from front to rear, or from side to side?"..Not any difference.

BEES IN A KEG.—C. A. T., of Topeka, Kansas, has a swarm of bees in a keg, which he desires to transfer to a common box hive. I would advise him to make a simple movable comb hive, as described in "Beekeeping Explained," and follow the directions given in "Bee Notes" for May, 1876. If thought best to use the box hive, one should be made a little higher than the depth of the keg containing the bees, and as large square as the diameter of said keg. After driving the bees from the keg, as directed in the Notes above referred to, turn the keg top down, and remove the hoops. With a narrow saw, saw off the sticks that hold the combs in place at the sides of the keg, and saw the combs loose from the staves. After removing the staves, saw the combs loose from the bottom. Now place the combs bodily in the new hive, in the same position as when taken from the keg. Cut a stick long enough to reach across the hive, and nail it across the bottom, so as to hold the combs firmly against the top of the hive when inverted. Place it in the same position on the stand as the keg occupied, and shake down the bees in front of it.

Connecticut Agriculture.

The "Nutmeg State," as it is often called without a truthful reason, is ranked as one of the manufacturing States, and it does produce a wonderful amount and variety of "Yankee notions," clocks and carriages for example, as well as an immense quantity of staple fabrics and wares of almost all kinds, not to mention destructive things, as the three million dollars worth of war material just carried out in two steamships from New Haven, to Constantinople, with much more going there and elsewhere all the while. Compared with Illinois and Ohio, Connecticut does not make much show as a farming State, yet it has some pretensions in that direction. In proportion to the entire population, it has nearly twice as many farmers who read agricultural journals, as any other State. It has **25,508** individual Farms. Though only one of these contains over 1,000 acres, yet 5,787 have between 100 and 500 acres, and twenty-six between 500 and 1,000 acres each. These farms comprise 2,364,421 acres, of which 1,646,757 acres are under cultivation; 577,383 acres in woodland, and 140,331 in other lands unimproved. The valuation of these farms is $124,241,382, averaging $4,870.68 each. They produced (in 1870) $26,482,156, or an average of $1,038 each. Farm implements cost $3,246,599.

Connecticut has the first "Agricultural Experiment Station" proper, established in this country, which is already doing much to aid the farmers to a very large saving in getting good fertilizers, and avoiding imposition. (See Prof. Atwater's account elsewhere.) A long established Board of Agriculture, helps largely to keep farmers wide-awake and going ahead. The Annual Farmer's State Convention, which held its session at Middletown, Dec. 13, 14, and 15, was a well managed gathering, and in many respects a model one, presided over by Ex-Gov. Hyde, of Stafford, but chiefly, though quietly arranged and engineered by the Secretary, T. S. Gold, of West Cornwall. Dr. P. M. Augur, State Pomologist, had charge of a fine assortment of apples, etc., from various quarters, showing the capabilities of the State in this line. Meetings were held mornings, afternoons and evenings, at each of which an intelligent speaker led off with an address on a specified subject, and after each address farmers from all parts of the State joined in a vigorous discussion pro and con, upon the leading topic of the meeting. Much practical information was thus brought out, and those attending each carried home new ideas for his own guidance, and for diffusion among his neighbors. Full stenographer notes of all said and done were kept, and the gist of them will hereafter appear in the Secretary's Report, which is printed for distribution. We omit for want of space a full report of the meeting, though information collected at this, as at other similar gatherings, appear under various headings in the successive numbers of the *American Agriculturist*.

Science Applied to Farming.—XXVI.

Agricultural Experiment Stations, and Fertilizer Control Systems—Their Advantages—European and American Experience.

The following occurs in an article by Prof. S. W. Johnson, on "Science as a Means of Agricultural Progress," in the Tenth Annual Report of the Sheffield Scientific School. The statements are true as they are pointed:

"If we gather from the best consideration of the evidence at our hands that a field needs potash or nitrogen, or phosphoric acid, we find plenty of parties willing to sell us these things, but we also find that we can not depend upon getting the worth of our money. Our markets are full of 'superphosphates,' 'poudrettes,' 'tobacco-grower's,' 'bone dust,' 'bone flour,' 'ground bone,' of 'bone meal,' 'pure,' 'best,' 'finest,' 'celebrated,' 'rotted,' and 'dissolved,'—of 'meat scraps,' 'blood and bone fertilizers,' 'animal dust,' etc., etc., some good, some bad, and in many cases the good appearing to be on the way to the bad. Many of our farmers have laid out their money for some of these things and know that they were cheated, by not getting what was promised and what they supposed they were securing. Some have been bitten so badly that they purchase nothing, unless it is ashes, plaster, bone, fish scrap, or something which they can judge of by its looks. Some again have purchased these very fertilizers whose value they believed they could estimate by inspection, only to learn when too late that they have been ingeniously deceived, and that the supposed 'bone' contained twenty to fifty per cent of water, oyster shells, plaster, or niter cake, which had no value for their farming.

"The German farmers have had the same experience. It is just about twenty-five years since in Germany, as here, the trade in superphosphates, guano and similar commercial fertilizers began. The same stupendous frauds by adulteration and dilution of good things were practiced there as they have been here, and we have great reason to fear, still are carried on here. But the Experiment Station has perfectly cured and rooted out these evils in all the districts where it has been established and appreciated. The Experiment Station there [in Germany] is prepared to furnish the farmers at small cost with an analysis of any fertilizer he proposes to buy. The farmers there avail themselves of this aid. They will buy no fertilizer without an exact statement of its composition, and they buy with the understanding that any deficiencies in the stipulated amount of fertilizing matters shall be made good or deducted from the payment. Under such circumstances manufacturers can sell nothing that is not substantially what it claims to be. A further result of this system is that low-grade fertilizers are little sought, and those makers who can supply the best article, of uniform quality and at the lowest rates, have the business. With large sales the dealers prosper, while the consumers are satisfied with their purchases, and instead of trying to see how they can get along with small use of purchased fertilizers, they are studying how to use the great-

est quantities to advantage. The fertilizer market in Saxony and Prussia, where the Experiment Station has the universal sanction and confidence of the farmers, is just as settled and satisfactory as any branch of trade, and the farmers there buy superphosphate, guano, potash salts, etc., with as much security of fair dealing as we can feel in the purchase of sugar or nails."

The only way to get good fertilizers at fair prices, is to know what makes them good, to understand what is the composition of the articles in the market, and select the ones which furnish the most of valuable materials, in the best forms, and at the lowest cost. In proportion as buyers make their selections in this way will competition be excited among sellers, based upon goodness of quality and fairness in price: poor articles will be driven from the market, and good ones sold, bought, and used with profit. To use them most profitably, we must understand what materials our soils and crops need; select the ones that furnish the lacking materials, and apply them properly. In farming, as in other business, the use of brains is necessary for success.

Numerous inquiries by visitors and by letters from nearly every one of the older States of the Union, in regard to the analyses of commercial fertilizers, and the "Fertilizer Control System" introduced in Connecticut by the State Agricultural Experiment Station, will, I trust, warrant some explanations here. The system adopted in Connecticut is substantially the same as has, with various modifications of detail, come into quite general usage in Germany and other European countries. The essential features are

1st. An agreement made with the Station by dealers in fertilizers to sell their fertilizers by guaranteed analysis, the verification of the analysis being left to the Station, and:

2nd. A provision whereby purchasers may have samples of the articles they buy analyzed by the Station at small cost, or for nothing.

In order to preclude all chance for mistake or evil as to the precise terms of the arrangement referred to, a form of agreement has been signed by the dealers who desired to place their wares, as sold in the State, under the supervision of the Station. This provides that all fertilizers sold in this State by the signer, or his authorized agents, at any price above $15.00 per ton, (except crude fish scrap), shall be guaranteed to contain certain specified percentages of nitrogen, phosphoric acid, potash, etc., etc.; that the official analyses made at the Station, shall be accepted as decisive of the correctness of the guaranteed statements of composition: and that the stocks of fertilizers kept for sale in the State by the signers of the agreement, or their agents, shall at all times be open to the inspection of the officers of the Station.

Three years ago, at the annual meeting of the Connecticut Board of Agriculture, were presented some comparisons between commercial fertilizers in use in Connecticut, and similar articles sold in Germany, where the control systems were in vogue. From these it appeared that the farmers of Connecticut had been paying at least 60 or 70 per cent more for the valuable ingredients in their fertilizers, than their brethren or the other side of the Atlantic. The cost of the raw materials is no greater here than there. In fact, large quantities are exported to the other side of the Atlantic, to be there manufactured into fertilizers. The cost of manufacturing is not much greater here. There was no just reason why farmers should not buy as good fertilizers and as cheaply here as in Europe. To aid them in doing so a control system was suggested. The results of its introduction are interesting.

At the annual Connecticut Farmers' Convention last December, a report of the first year's work of the State Experiment Station was given. This included accounts of analyses of fertilizers, among the rest, some 35 samples of articles sold before the establishment of the Station, and some 77 samples sold under its supervision. The number of these articles seemed ample, and the range in quality was certainly wide enough to afford a fair exhibit of the effect of the supervision exercised by the Station. Basing the comparison upon the costs of valuable ingredients, as determined from composition and selling prices, it stands as follows:

VALUABLE INGREDIENTS.*	AVERAGE COST PER POUND. *In fertilizers sold before establishment of Station.*	*In fertilizers sold under supervision of Station.*
Nitrogen	47.0 cts.	23.0 cts.
Soluble Phosphoric Acid	18.0 cts.	14.0 cts.
Insoluble Phosphoric Acid	11.2/5 cts.	5.1/2 cts.

If, instead of taking the fertilizers all together, we select a single class, and one of the most important ones, the nitrogenous (ammoniated) phosphates, the comparison will stand as follows:

VALUABLE INGREDIENTS.	AVERAGE COST PER POUND. *In fertilizers sold before establishment of Station.*	*In fertilizers sold under supervision of Station.*
Nitrogen	59 2/5 cts.	24 9/10 cts.
Soluble Phosphoric Acid	19 1/2 cts.	15 1/10 cts.
Insoluble Phosphoric Acid	21 1/10 cts.	5 3/5 cts.

In brief, the average actual cost of the fertilizers sold under the supervision of the Station is less than half that of those sold before the Station was established.

To make such a comparison as the above absolutely accurate, it would be necessary to take into account the total quantity, composition, and price of each article sold in the State. And while, on the one hand, more of the better class of articles analyzed are sold, on the other, there are doubtless a good many inferior articles which we did not get hold of at all. The figures doubtless under-rate rather than over-rate the benefit accruing to the farmers of the State from the introduction of the "Control System."

The amount paid for fertilizers for the 25,508 farms in Connecticut, is variously estimated from $500,000 to $1,000,000 per annum. Single towns are stated to use from $30,000 to $50,000 worth per annum. Taking the lower estimate ($500,000), if the Experiment Station can save only one-tenth or one-fifth instead of the one-half indicated above, the annual saving in the first cost of the fertilizers bought by the farmers of the State would be from $50,000 to $100,000 per annum. And when we consider the loss in the use of land and in tillage when poor articles are applied, the advantage that comes from being certain of the quality of articles bought, and from the more rational use that comes with better understanding of the nature of these articles, it is clear that the benefit must be much greater than these figures indicate.

The advantage that would be gained in most of the other of our older States from the introduction of such an enterprise as I have been speaking of, would doubtless be much greater than in Connecticut. The trade in fertilizers is much larger in many of them, and there are but few in which as much has been done in this direction, as had been done in Connecticut previous to the establishment of the Station, particularly by the State Board of Agriculture, and its chemist, Prof. Johnson, who is the pioneer in this sort of work in this country.

The sale of fertilizers by guaranteed analyses, and either inspection by competent authorities, or what is very much more important and useful, the provision of means whereby purchasers may have the correctness of stated analyses tested at little or no cost to themselves, are indispensable features of any control system. Just how the first of these provisions will be best enforced in any given State, will depend on circumstances. One most important point to be secured is the mutual coöperation of leading farmers and dealers. The rather remarkable success in this respect gained here, was due to several causes. The people were educated up to the point where they saw the good of it. The plan was initiated and executed by the Advisory Committee of the Station, a body which includes some of the most influential farmers of the State. The movement was made to appear, as well as to be, one on the part of the farmers, and dealers saw it was for their interest to join. Some thirty individuals, firms, and companies, including many of the heaviest manufactures in the country, and nearly all of the more influential ones who sell in Connecticut, have allied themselves with the Station. They have done so because they have seen that this was the surest means to secure the best patronage, exclude illegitimate competition, and put their trade on the most just and profitable basis.

I have insisted strongly upon the need of means whereby purchasers shall be enabled to have samples of fertilizers they buy analyzed at small cost or for nothing. The importance of this is well illustrated by some of the facts that have come under the notice of the Station. One of the worst frauds discovered was an article sold to several members of a Farmer's Club, who had taken special pains to have some of the fertilizers they were about to purchase analyzed in advance, but had, in this case, taken the assurances of an agent that his article "had been analyzed and was excellent." Another of the poorest articles analyzed was one of a number of samples sent by manufacturers to another Farmer's Club, and brought by the latter to the Station for examination. The great difficulty in the way of analyses is the expense, which at fair rates will vary from ten to sixty dollars. For an ordinary superphosphate, a fair price is thirty dollars or more. At the Station here analyses for public use are performed gratuitously so far as the time at the disposal of the chemists will allow. While a large number of analyses have been made during the past year, in no case has any charge been made to farmers for whom they have been performed.

W. O. ATWATER.

* The number of articles containing potash was so few and its quantities so small, that it is omitted in the above comparisons.

Ogden Farm Papers.—No. 84.

BY GEORGE E. WARING, JR.

The question of summer-fallowing, to which I have referred in earlier numbers of these papers, is brought again to mind by the receipt of an analysis from Prof. Atwater, of some earth-closet manure that I submitted to him for examination. I have on hand about two tons of this material, which I have purposely kept, in order to see how often earth (or anthracite coal ashes) may be used without losing its efficiency. The experiment was begun six years ago. A little of the manure has been used on flower beds, etc., and a little fresh ashes has been added, but not enough to effect the general result. The closets are filled, on an average, about six times a year. When the vaults are emptied, the product is simply heaped up in a well ventilated cellar, and left to dry; the heap is then used as a source of the next supply needed. The whole amount is enough to fill the reservoirs three or four times, and I estimate that the material now on hand has passed through the closet *ten times*. So far as can be judged by its appearance and smell, it is precisely the same as when first prepared for use—a dry mixture of earth and ashes, say one part of the former and three parts of the latter. It has the same apparent effect in the closets that it had at the outset. Neither the eye, the nose, nor the hand can detect any change from its original condition. The examination in the laboratory has been equally powerless to detect any trace of organic fouling. This is the report:

CONN. AGRICULTURAL EXPERIMENT STATION,
Middletown, Nov. 7th, 1876.

"The following is the result of alalysis of closet earth, etc. (*Parts in* 100.)

Water	1.31
Organic and Volatile	10.72
Phosphoric Acid (P_2O_5)	0.37
Potash (K_2O)	0.33
Nitrogen	0.28
Equivalent to Ammonia	0.34

(Signed) ED. H. JENKINS, Chemist."

Prof. Vœlcker gives the following analysis (so far as these elements are concerned) of fresh earth prepared by drying and sifting for use in closets:

Organic and Volatile	9.88
Phosphoric Acid	0.18
Alkalies and loss in Analysis	1.35
Nitrogen	.31
Equivalent to Ammonia	.37

Of course earths vary, and the composition of the ashes would modify the composition of my mixture, but, practically, making due allowance for such variation, this material, which has passed

ten times through the closet, has not had its composition materially affected by the paper, fæces, and urine, with which it has been so often charged. The amount of these foreign matters has not been slight. The closets have been used—at a moderate average—by four grown persons for six years. It is estimated that the solid (dry) matter voided in a year by an adult is, in the fæces, 23 lbs, and in the urine 34 lbs. Assuming that one-third of the urine was voided into the closets, the total dry matter would be about 34 lbs. yearly, for each person, making a total, for 4 persons and 6 years, of over 800 lbs.

This solid matter would contain over 230 lbs. of nitrogen. The two tons of my material contain only about 400 lbs. of solid organic and volatile matter, and probably the most of this was there before it went into the closet at all. The content of nitrogen, by the analysis, will be only about 11 lbs.—in fresh earth, as per Voelcker, it is about 12 lbs. Practically, all the solid and liquid excrement, and all the paper and chance rubbish that have gone into the closets, have entirely disappeared.

It is very important for our purpose to know what has become of them. I venture the hypothesis that they have been as effectually destroyed by combustion, as though they had been thrown into a furnace. And I hazard the further inference that a load of stable manure, mixed with the soil of a field which is "summer-fallowed," will go the same gait to destruction—and not the manure alone, but equally the enormous accumulation of organic remains (roots, etc.) left by its former crops. More or less of all this foreign matter will be turned to charcoal, in proportion to the thoroughness with which the soil is opened to the air, and if the cultivation is very defective, much of it may thus escape entire destruction. If the cultivation is very thorough, very little of it will escape.

All porous substances condense gases within their pores—especially do they fill themselves with oxygen in a very active condition. A heap of cotton waste, saturated with grease from machine cleansing, sometimes breaks into actual conflagration from the rapidity with which its oil is oxidized. Rapidity of oxidation gives intensity of heat, and "spontaneous combustion" is only such a hastening of the process as to produce heat faster than it can escape safely. Charcoal (which is so porous that it has interior surfaces equal to from 50 to 100 square *feet* to the cubic *inch*) condenses oxygen in a condition most serviceable for deodorizing purposes, and it is now well understood that it is not simply an absorbent of foul gases, but a destroyer of them. Not alone is this true with regard to gases, but to all organized matters. Leaves mixed with charcoal dust and made moist, entirely disappear. The oxidation is believed to be due, not at all to the chemical character of the carbon, but only to the porosity of the charcoal; and other substances favor the process in proportion to their porosity. Platinum sponge is a very active inciter of destructive oxidation. Dry, or slightly moist earth is a busy agent in this work. A bit of muslin covered in the ground, soon becomes rotten, and in time disappears. The foulest human excrement, covered with sufficient earth to take up its moisture, without becoming so wet as to exclude the air, (oxygen), is at once deprived of all smell, and within a few weeks every trace of it has passed away. The common belief is that it is "absorbed" by the earth. This is true, but it is probably absorbed only to be consumed. The pores of the earth are the slow furnace in which it burns silently away, leaving only ashes behind.

If this process takes place in the vault of the earth-closet, why not equally in the oft-turned soil of the open field, where the exposure to the air is so much more free? It is not to be supposed, however, that the earth is no better fitted for plant growth by its use in the closet, nor that summer-fallowing is without great effect. The earth is not merely a passive container of the organic matters decomposing within it, and of the oxygen by which the decomposition is urged forward. It is a compound substance, the chemical combinations and the physical conformations of which are much modified by the chemical activities taking place within it. So far as its most important constituents (mineral plant-food) are concerned, it is vastly benefited by these activities. Its particles are disintegrated, and its unavailable mineral food is developed for the use of roots. This result may very well justify a resort to summer-fallowing under proper conditions, and it may so add to the value of earth used in closets, as to make the manure question a valid argument in favor of the earth-closet. The frequent good effect of bare fallowing, and the well known instances of the successful use of closet earth, can, it seems to me, be accounted for in this way, and in no other.

All I maintain is that the loss of organic matter—roots, manure, etc.—in fallowing, and the entire destruction of the corresponding matters in closet-earth, should be taken into the account in deciding our course; and that the common expression among farmers that land may be "plowed to death," is based on a sound principle.

Perhaps when we learn more about it, we shall know that the fertility is due less to the amount and kind of plant-food contained in the soil, than to the ceaseless changes of form and relative condition of its decomposing organic matters, and of the reaction of their resultant products, (and of the heat evolved), upon the more dormant mineral elements. Where all is seething with decomposition and re-composition, there, perhaps, will the hungry young root find its best foraging ground. The greatest activity of disorganization may give the greatest activity of new organization.

One more deduction may be made from all this: It has been held to be a leading and a very serious objection to the earth-closet system, especially for use in towns, that the labor of bringing in the enormous amount of earth required, and of carrying out the increased quantity from the closet receptacles, would call for too much costly handling. This objection would be a sound one were the earth to be regarded only as a medium for the odorless removal of the excrement; but if we accept the belief that it is only the lurking place of that best of all scavengers, oxygen, and that year after year the cleansing work may go on, over and over again, in the always purified recesses of the same earth—no trace of any impurity remaining—then our supply may be taken in, once for all. We shall need enough to give time for rest and oxidation, between the successive usings of each portion, but no provision need be made for frequent introduction of fresh material. My whole household has been amply provided by two small cart-loads of earth, brought in six years ago, supplemented by the sifted ashes of the kitchen range and furnace. For a long time, even those have been carted away—we prefer the old stock, as fresh ashes are too dusty.

It has been suggested that there may be danger of infection in the accumulation of closet-earth in connection with habitations. So far as experience goes, here, in Europe, in Jamaica, and in India, no contagion has ever been traced to a *dry* earth closet, nor to a sheltered heap of closet-earth. Pettenkofer's "ground air" poisoning—if his theory is sustained—traces to occasional conditions of saturation. Closet-earth, properly managed, is always dry enough for the free entrance of air. It is not *fermentation*, but *slow combustion*, which destroys its burden of filth, and—if we may speculate on the feeble data now available—it is to fermentation, which Pasteur aptly calls "life without air," that we are to look for the reproduction of the living germs of infectious disease.

Mr. Haven (Mich.) writes that about two years ago he bought my work on Draining, and put in about 80 rods according to its directions. Some of the ground, cleared 15 years ago, had never been plowed. It was a wet muck-swamp with a boiling spring, which kept it saturated even in summer. The quicksand troubled him very much, but he put tarred paper on the joints, and packed the tiles in clay—using no porous matter over the tiles. The spring was led away by a 2½ inch tile. The land is now sound and dry. If people would only understand that water enters the tiles *from below*, and that the top and side of every joint should be made as tight as paper will make them—to keep out dirt—they would get a much better result from their work. Newspaper is as good as any other. All we need is to keep the dirt out, until it is firmly settled—after this it will hold itself in place. It is only the loose crumbs of new filling that will do harm, Mr. Haven employed no engineer. He simply followed the instructions of his book.

In the autumn of 1867—nine years ago—Mr. T. T. Turner, of Normandy, Mo., gove $350 for a Jersey cow. This was as high a price then, as $600 would be now. High though it was, it was a good investment. She and her descendants have brought Mr. Turner $330 in premiums at fairs. He has sold 21 of her descendants for $3,099, and has nine head now on hand worth, at the lowest estimate, $2,575. This is a total of $6,004 in nine years. If he had given as much for this cow, as Mr. Chas. L. Sharpless has just paid for "Young Pansy," ($2,500), he could have added $1,000 for insurance, and still have made a profit. The fact is, that a good cow or a good bull lasts for ever. Captain Turner's grand-son (if he keeps up the herd) will feel the influence of old "Plenty," and so will all who own the descendants of her offspring which have been sold. One good ancestor starts a movement which will manifest itself to the remotest generation. Its *blood* lives on, and no one can estimate its ultimate value. Some day we shall have a herd *all* the members of which are as good as good breeding can make them. Whoever owns this herd, can sell his best bull calves for $1,000 apiece, as fast as he can supply them. Fortunately, Jersey breeding is in the hands of skillful men, working with a good organization, and determined that no "fancy" quality shall stand in the way of the highest dairy quality of the race. Fortunately, too, the better butter-making farmers appreciate the value of the breed, and there is reason to believe that before many years, Jersey blood will be a *sine qua non* in every butter-producing herd.

It will be agreeable to many owners of good Jerseys, to know that the rules of the American Jersey Cattle Club have been so modified, that animals imported from the Island can be entered on evidence of their importation, without the necessity for the photograph and certificate, which are now required. The *date*, importation, name of importer, etc., must be given of course.

American Hops.

The growing of hops in the United States is becoming a staple business. It has been lifted out of its previous unsettled, speculative character by the demand for foreign export, which has now become settled and permanent. Foreign markets are now opened in England and Germany, and our product has acquired an established reputation. It is not to be expected that hop growers will in future dig up their yards in disgust, at the impossibility of disposing of their crop, but those who once enter the business will remain in it, taking good and bad seasons as they come, sure on the average of a fair profit for their labor. The past year's crop amounts to 190,000 bales of 200 pounds each. Last year 60,000 bales were exported, and the probability is that the present year's export will equal that of last year. Up to November 1st, 1876, over 55,000 bales had been received at New York, against 24,000 bales up to the same date last year, and 37,000 bales had been exported. The great hop-growing districts are in Western New York and Wisconsin, and the growers in these localities have formed an association for the collection of statistics, and of information relative to their business, which has been found of great value to their interests. In view of the established character of the American hop trade, and the promising future that may be expected for it, we may look for a considerable increase in the culture of this crop, and improved and more successful methods of managing it, as regards diseases and vermin which affect it, and the processes of curing and preparing for market. The prices for the past year have averaged 27 cents per pound, which has given a very profit-

able result, yielding from $250 to $300 per acre. This is not by any means the highest yield per acre, but there are seasons when prices are much lower, and it is only by steadily perservering with his crop, through a series of years, that the grower reaps his profit, which then on the whole is satisfactory

A House, Costing $7,000.

BY S. B. REED, ARCHITECT, CORONA, LONG ISLAND, N. Y.

The accompaning plans were designed for a suburban residence erected during the past year by Mr. Bernhard Greeff, at College Point, Long Island,

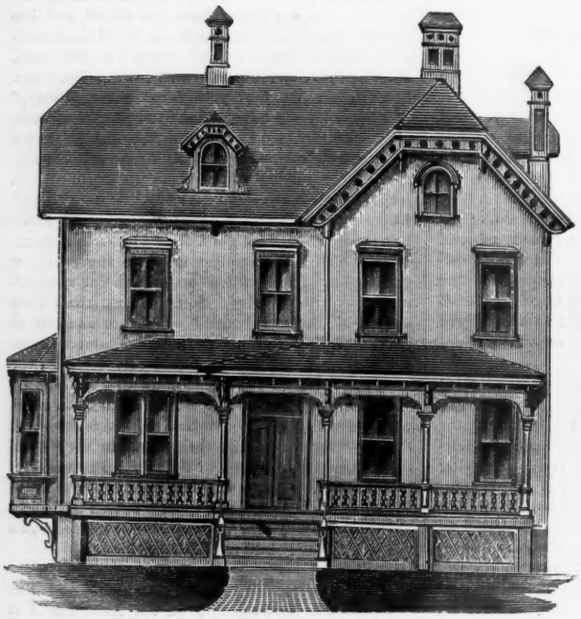


Fig. 1.—ELEVATION OF FRONT OF HOUSE.

N. Y. The general outlines were determined with especial reference to the location—which is elevated, overlooking the East River to the north and west, Flushing bay and the village to the south, and with an eastward frontage to the street, giving pleasant views in all directions. With these points fixed, it is easy to see the propriety of placing a broad side to the bleak or northern exposure, and putting such breaks or angles as are required in the more sheltered directions....**Exterior,** (fig.

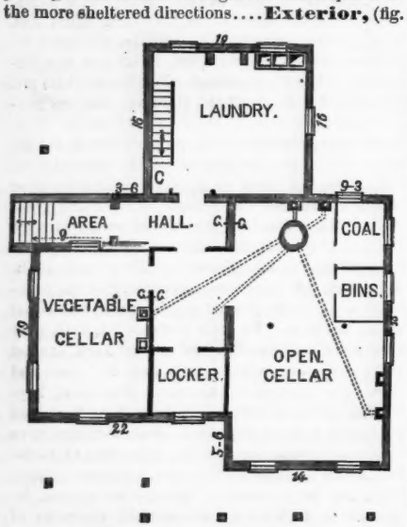


Fig. 2.—PLAN OF CELLAR.

1.)—The style of this example is homelike, and shows to the best advantage when placed in comparison with those of more fanciful design. Sufficient irregularities are made in angles and projections to give variety. The details shown in the front finish are continued around the sides and rear. The hight of the rear wing is one story less than the main house. While the appearance of this house is agreeable on every side, the most pleasing is from the southerly direction....**Cellar,** (fig. 2.)—Hight of ceiling 7 feet, of which 4 feet are above ground. All parts are well lighted with windows, except the hall, which has a sash-door with iron guard. The Laundry has an open stairway to the kitchen, and is provided with wash-tubs. A Water-closet is placed under the stairs. A Furnace is placed in the northern division of the cellar, with pipes for conducting warm air to each room and hall in the two stories of the main house, and to the bath-room....**First Story,** (fig. 3).—Hight of ceilings in main house 11 feet; in rear wing 8 feet 5 inches. The Front Entrance is through a vestibule leading to the main hall. The Hall is large, contains the principal stairs, with a closet under them, and communicates with the parlor, sitting-room, and rear entry. The Sitting or Family-room is arranged to be the pleasantest apartment, has double-windows front and rear, (the rear ones opening to the floor), and a large bay-window giving an outlook in three directions. Each of the principal rooms has grates for open fires, side registers leading from the furnace, and marble mantles. The Rear Entry communicates with the several apartments, and the rear piazza. The Kitchen has an elevated range, boiler, sink, drain-board, two closets, and enclosed stairways leading down to the laundry, and up to the second story; it communicates with the dining-room through the butler's pantry, the latter is "dresser finished" with sash-doors, copper wash-trays, etc....**Second Story,** (fig. 4).—Hight of ceiling in main house 10 feet, in wing 9 feet, with side breasts 5 feet. The floor of the wing is level with the platform of the main stairs. The full ceiling above this platform is arched over, and conceals the roof angle of the wing. An inside and smaller arch leads to the passage beyond. Both of these arches may be seen from the lower hall, and are pleasing features. An arch between the closets at the opposite end of the hall makes an alcove to the hall window. The room divisions are similar to those of the first story. Closets are provided for each chamber. The Bath-room is conveniently arranged and furnished.... **Attic.**—Hight of ceiling 9 feet, with breast-walls 3 feet. There are 3 good sized chambers, a hall, and 7 closets in this story. Four dormer and three gable windows are provided .... **Construction.**—The *time* allowed for the erection of most buildings is too limited. Although this house was built by contract, no haste was enjoined, six months being allowed for its completion, giving the builder an opportunity of selecting the materials and workmen, and of applying the parts in their proper time and order. The exterior foundation walls, to the level of the ground, are of broken stone, 18 inches thick; the balance of hard brick, 12 inches thick. The frame is of full-sized timber; all beams and studding are placed 16 inches from centers. The siding-boards are 6 inches wide, rabbeted, and laid 5 inches to the weather, on stiff tarred "sheathing-board," weighing 1½ pound to the square yard. The exterior frame is "filled in" with pale brick. The main and wing roofs are covered with Keystone slate on tarred felt over hemlock boards. The main gutters are of double cross tin, laid in with the slate as shown in the *American Agriculturist* for May, 1875. The roofs of the piazzas, and bay-window, are of single cross tin. The cellar bottom is concreted with hydraulic cement and gravel, 3 in. thick. The laundry and cellar hall have the usual wide flooring, and are thoroughly plastered and finished. The partitions in the cellar, and the coal-bins are of dressed plank. All the floors in the two principal stories are double, the first being of ordinary dressed flooring—the second is "*parquet*"

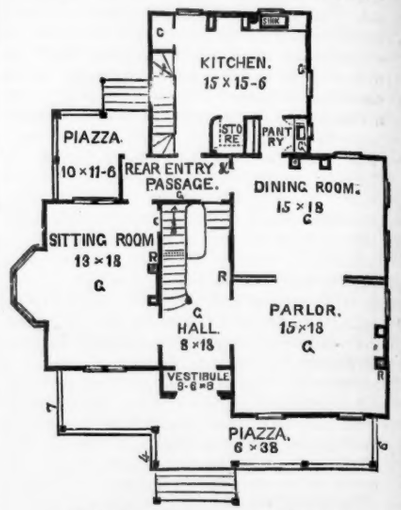


Fig. 3.—PLAN OF FIRST FLOOR.

flooring laid of ⅜x2½ inch yellow pine, and black walnut. The black walnut is used only in the borders and centers. These borders are made by laying from five to eight courses of alternate woods all around the rooms, ending at the hearths. The widths and arrangements are changed slightly in the different apartments to give variety. These floors are intended to dispense with the use of carpets; rugs, covering the central portions of the floor, being adopted in their place. Unlike the stationary carpet, these may be easily removed for airing, and the floors cleaned daily if desirable. The three upper stories are hard-finished, on two coats of brown mortar. Each room and hall in the first and second stories of the main house have suitable stucco cornices and centers. The interior wood-finish is complete, all of clear and seasoned materials. Bronzed hardware is used in the first story, and porcelain in the balance of the building. Gas-pipes are inserted for thirty lights, properly distributed through the house. Five bells are included in the fittings. All wood, tin, and exterior brick work has two coats of best paint. The outside doors, and the halls, are grained in imitation of hard woods. The stair rails, door saddles, and the

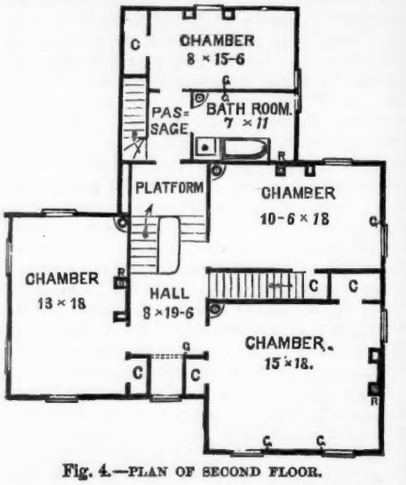


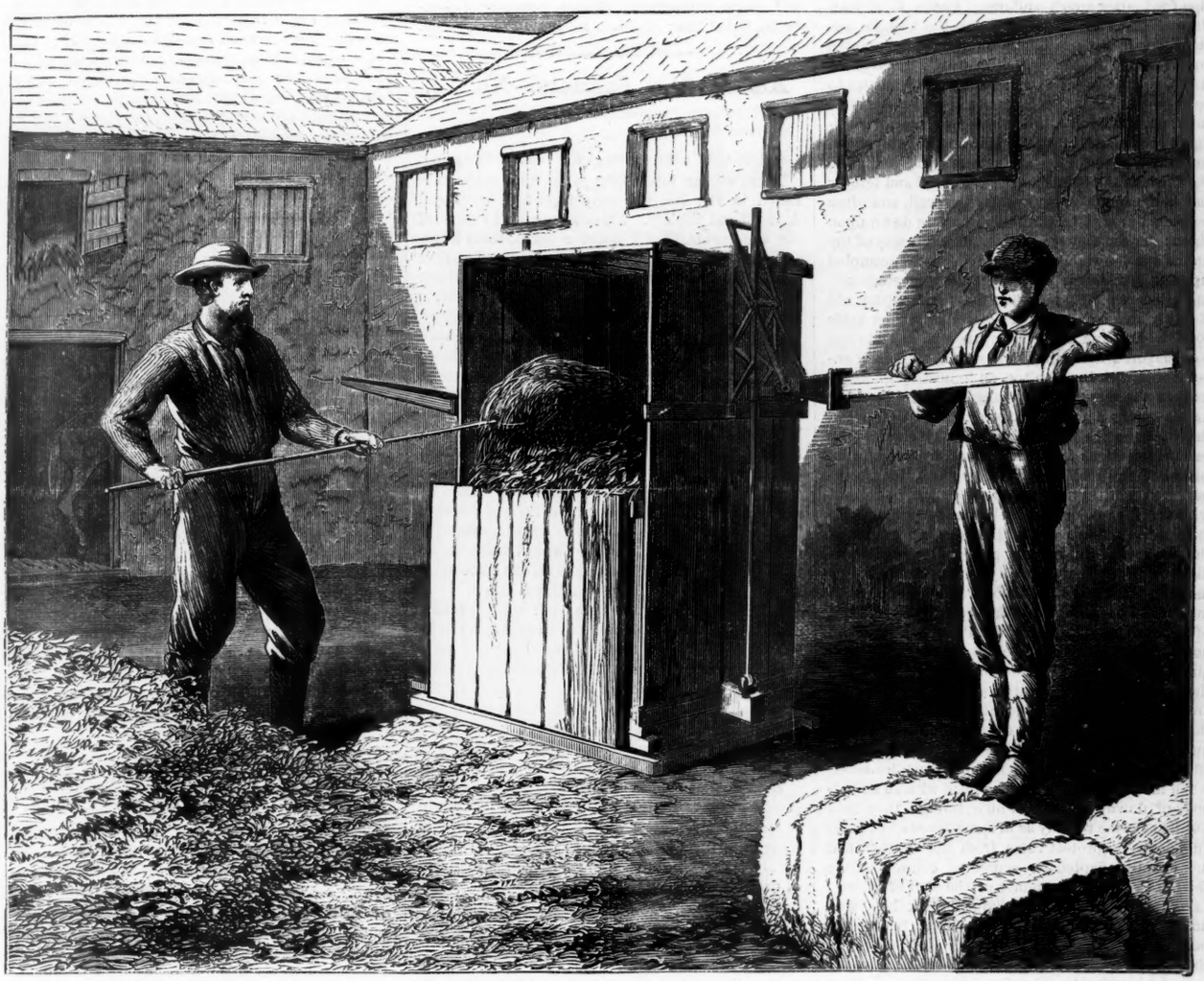
Fig. 4.—PLAN OF SECOND FLOOR.

hard wood flooring, are rubbed with linseed oil. The following are the estimates of the *cost*, as per contracts:

Mason work, completed		$1,650.00
Roofer's work,	do	387.00
Carpenter's work,	do	3,573.00
Plumber's work,	do	590.00
Furnaces,	do	200.00
Mantles,	do	300.00
Painter's work,	do	350.00
Total		$7,000.00

Baling Manure for Transportation.

The production of manure in the stables of the large cities, amounts yearly to many thousands of tons. In its ordinary condition this can not be profitably transported to a long distance, nor to a comparatively short distance, unless a conveyance by water can be procured. Even when carried a few miles, the slow process of repeatedly handling it with forks, is costly, and largely restricts the use of it. Any method of so treating this city manure that it can be rendered less bulky, and brought into a condition in which it can be quickly handled, would not only add much to its value, but would largely extend the distance to which it could be carried for distribution to the farmers who need it. The desired plan appears to have been hit upon by Mr. Ackerman, of New York, who conceived the idea of pressing the manure into bales, for preservation as well as transportation. Nothing could be more simple, and it seems strange that the idea did not long ago occur to some one engaged in the manure business. The inventor of the method, however, is the first who has applied it to this use, and he has procured a patent for the process. Considering that a largely increased value is given to this refuse matter by the process, and that every one concerned may be a gainer, it is not unreasonable that some benefit should accrue to the patentee. The baled manure was exhibited at the late fair of the American Institute, where an award to the exhibitor of a silver medal was recommended by the judges of agricultural implements and appliances. The process of baling is shown in the accompanying engraving. The fresh manure, as it is thrown out from the stables, is pressed in an Ingersoll press, or in any other press that will bale hay. When the manure is so compressed that a bale the size of an ordinary hay bale weighs 400 lbs., it is bound by wires, and is then ready to be shipped like any other merchandise. Thus pressed and baled, ten tons or more may be carried upon a car, and if shipped by vessel, it can be carried much more easily than heretofore. The loading of ordinary manure adds greatly to its cost, but when baled this is largely reduced. Besides these advantages, the quality of the manure is improved by the process, there being no danger of its being injured by over-heating while it transit. A bale that had been pressed for many months, was exhibited to the judges at the American Institute, and was found perfectly decomposed within, and in the very best and most perfect condition. There had been no waste of any valuable constituent; the manure was moist, of the texture of the finest peat, and in fact was in every respect all that could be desired by the most exacting farmer. By this process, the manure made at any large stable can be pressed daily or weekly, and the solid, compact bales may be piled up in a shed to await a convenient season for removal, the compressed state of the manure prevents its fermentation, excepting very slowly, and it remains in a good condition indefinitely. This invention benefits both producer and consumer. The proprietors of the stables will receive a higher price for their manure, and the farmers or gardeners can afford to pay the higher price, and be gainers besides, because of the ease and rapidity with which they can load and transport the bales.



BALING STABLE MANURE FOR TRANSPORTATION.— *Drawn and Engraved for the American Agriculturist.*

The Plymouth Rock Fowl.

BY DELORME BENEDICT, ROSSVILLE, STATEN ISLAND, N. Y.

[The portraits of the Plymouth Rock, given in the group of poultry on our first page last month, were drawn from birds exhibited by Mr. Benedict at the Hackensack Poultry Show, and which carried off the first prize for this breed. As these fowls are now attracting much attention, we requested Mr. B. to give an account of their peculiarities, and his estimate of their value. This he has done very fully in the following article, for which we were unable to find room last month.—EDS.]

The excellencies which are found distributed among the various breeds of fowls, are usually accompanied by some defects. The Plymouth Rock breed, in my opinion, embodies in a large degree more of the good qualities, with less of the defects, than any one established breed, which renders it the "farmer's fowl" *par excellence*. Undoubtedly the first requisite in any breed of fowls for it to be *profitable* to the farmer is, hardiness or vigor of constitution. Unless a breed has this, the standard will not be maintained for any length of time under the care usually bestowed by farmers upon this branch of husbandry. Ability to withstand the severe climatic changes of the North and West, has been imparted to the Plymouth Rock through thoroughly acclimated ancestors—the American Dominique. From this breed it also derives the color of its plumage, which was one of the numerous varieties of color found among the common barnyard fowls of this country, before the introduction by importation of foreign blood, and known as the

"hawk color." A striking peculiarity of this fowl is the "working garb," so to speak, in which it presents itself; the entire absence of every superfluity, which, however pleasing to the eye of the fancier, is to the farmer suggestive of a want of sympathy with him in his daily toils, and who wants nothing so much for show as for use. There is no excess of comb and wattles in this fowl, as in the great egg-producing breed, the Leghorn, which, in severe cold winter weather, is sure to become frozen, and this, if it does not cause the death of the fowl, after much suffering, leaves it at least disfigured. The Plymouth Rock has a single, upright, moderate sized, well proportioned, serated comb (as may be seen by the illustration given in the *American Agriculturist* in January), with wattles to correspond. This fowl is not burdened either with the crest, muff, and beard, which by some are considered ornamental in the Houdan and Polish breeds, but which nevertheless are a great disadvantage to the fowl, as the chicks, when feathered and left by the hen, cannot see upwards very well, and often become a prey to hawks, which pounce down upon them; nor can they readily get out of the way of the animals in the stable, or cow-shed, but are trampled upon and maimed, or disappear very mysteriously in the pig-pen. Though like the Dorking (that old English breed so justly celebrated as a fine table fowl) in size, and in the abundance of delicate and well flavored flesh, the Plymouth Rock is not encumbered with the fifth toe, an indication of weakness in the legs, which peculiarity in the Dorking has so strong a tendency to run into a deformity, that it is, as all breeders know, only checked by careful selections for breeding, and by frequent infusion of fresh blood. The Plymouth Rock is superior also in having bright *yellow legs*, instead of white or flesh-colored legs, like the Dorking. So long as the yellow color of the legs is regarded in the markets of this country as the most reliable indication of the good quality of the flesh, it is a matter that cannot be ignored—however false it may be in fact, until consumers are educated out of the notion. The legs of the Plymouth Rock are not only yellow, but are clean, not lined with a quantity of stiff feathers down to the extremity of the outer toe, as the Asiatics are. These feathers are in the way during incubation, and often cause the breakage of eggs in the nest, and the consequent spoiling of the whole setting, if not discovered in time. It is like the Brahma fowl, however, when mature, in being well supplied with an abundancy of downy feathers, which, though they may not lie as close to body as in some breeds, yet do so sufficiently to protect them from the weather, and are equally adapted to secure the comfort of the fowl in the heat of summer or the cold of winter. Like the Brahma, the Plymouth Rock lays well during the winter, but is never so much inclined to become broody as to be an annoyance, a propensity that has discarded the Cochin fowl from many barn-yards. On the other hand, this absence of all desire to incubate, as is the case with the Leghorns and other egg-producing breeds, is so serious an objection that it prevents these breeds from becoming generally introduced. The Plymouth Rock hens are good mothers and sitters. The chicks mature moderately early, and when grown, are not excessive consumers of food. It is claimed that this fowl originated from a cross between the common American Dominique, as already stated, and the Black Java, a breed almost, if not quite, extinct in this country. This claim is disputed by some, and is giving rise to much warm discussion among breeders at the present time, and is not yet settled beyond question. It cannot be denied, however, that a fowl entirely resembling the Plymouth Rock may be produced by substituting the Brahma for the Black Java, and it only remains, by careful selection and a period of breeding, to establish a strain indistinguishable from the Plymouth Rock, and yet have no relation to it. This fact does not go, however, to prove that the claim put forth of its origin is not the correct one, though it might be questioned on account of the buff color of the Plymouth Rock fowl's egg, which is like the eggs of the Brahma, a circumstance which rather favors the opinion that it has originated from this source. This dark color of the shell is objectionable to many, however much may be said in favor of the egg in other respects. It is certainly not so beautiful as the pearly white, well shaped egg laid by the Black Spanish hen, and until this change is effected by our breeders, while still retaining and improving the good qualities of this fowl, the Plymouth Rock can not yet be regarded as perfect. Taken all in all, there seems to be no breed which will give so general satisfaction as will this, or which will return a larger profit for its keeping, and these advantages should certainly recommend it for trial, at least as the farmer's fowl.

Among the Farmers.—No. 13.

BY ONE OF THEM.

Good Roads, and Springs for Heavy Wagons.

There was an interesting paper upon roads published in the last quarterly report of the Royal Agricultural Society. I was so struck by some of the statements, that I noted a few of them in my memorandum book. For instance, the writer quotes Law's treatise on roads, as stating that the power required to move one ton upon a railway, is 8 pounds. That is, as I infer, after a load is started it requires a traction power of 8 lbs. per ton to keep it in motion; on a level well laid pavement of hewn stones, the traction is 33 lbs., or four times as much; on a hard, McAdamized or Telford road, of best quality, six times as much, or 48 lbs.; on Flint McAdam, by which I infer one newly dressed with flinty stones, not yet compacted to an even surface, 65 lbs., or eight times as much, while on a common gravel road it requires 147 lbs., or sixteen times as much power as to move one ton upon a railway. That is, if one horse will move upon a railway a freight car with its load, which will often be 16 tons, it will require 16 horses to do the same upon a common road, and I presume this is true.

This is a strong argument in favor of good roads, and a strong one also, in favor of having iron tracks laid upon one side of the roadway along our most traveled country roads, over which heavy teaming is done. What a saving of horse-flesh it would be if we could double or treble the loads upon our market wagons! All that is needed is a railway track, with extra broad rails, so made that a wagon can be pulled on or off the track at any point.

The grade of a first class road, the writer states, should never exceed 1 foot of ascent or descent in 24 feet of length. Our roads are often 1 to 12, and sometimes 1 to 8. Of course traction increases rapidly with the grade. The traction, or severity of draft, is not alone felt by the beasts of draught, but through their action it is manifested upon the road itself. The horse's hoofs dig out a deep track where they travel, if the road is not frequently dressed. Traction is directly as the load; inversely as the diameter of the wheels.....On a paved, or hard McAdamized road, it is independent of the width of tires, *provided this exceeds 3 or 4 inches*..... At a walk, traction is the same with or without springs....On a hard road, traction increases with, and as the velocity, at all speeds above the velocity of 2½ miles an hour. (That is, I suppose, it bears a direct relation to the friction).....On soft roads traction is independent of velocity....The destruction of the road is at all times greater as the diameter of the wheels is less, and when no springs are used.

Now if springs or no springs on heavy vehicles seriously affect the road, what effect must their absence produce upon the wagons?

This is a matter, the importance of which I had little idea of, until it was recently forced upon my attention. Now, facts exhibiting the great good of springs upon heavy wagons, frequently force themselves upon my attention, e. g., wagons often pass my office, on the street, probably 60 feet away, with as heavy loads as two horses can draw, say 4 to 6 tons; some are on springs, and some are not. Those which are on springs make very little jar, the others shake the building, in fact nearly the whole block. When the solid ground, covered with four and five story storehouses is thus shaken, what must be the effect upon the wagon? It is an old law of mechanics that "action and reaction are equal," even our toughest hickory, and ash, and elm, cannot long stand the strain put upon them when they are required to jar the ground of a whole city, like a miniature earthquake.

Torsion Springs for Farm Wagons.

About a year ago I put under a new farm wagon which I had built, a set of the "Erie Torsion Springs," calculated to bear 3,000 pounds. I do not often haul more than one ton upon it, and up hill and down hill this is a fair load for light horses. So far, I am delighted with the action of these springs. They are so constructed that they can not "bump," there being a constantly increasing mechanical advantage given to the spring as the load is increased, so that although the elasticity is diminished by the weight, there can never be a jar. On rough, stony, or frozen roads, I can see a notable difference in the wear and tear of the vehicle, or rather in the strain to which it is subjected, and I find I can drive off without a load or with a light one, with comparative comfort at a brisk trot, although, of course, the springs are not intended to make it easier to ride in the wagon. They are in my estimation a very important invention, and are easily applied, without the aid of the wheelwright.

One of the paragraphs noted above, is to the effect that upon soft roads

"Traction is Independent of Velocity."

This seems strange, but it is precisely the result which was such a poser to the wiseacres of the Auburn Plow-trial, a few years ago. They found, if I recollect aright, that a plow drawn at the rate of four miles, or so, an hour, produced no greater effect, or even a little less, upon their accurate dynamometer, than the same one moving 2 to 2½ miles. The expression quoted is, I think, likely to create a misconception. Traction may be measured, we will say, by the strength of the trace-chains; thus, if they will move a wagon at the rate of 2½ miles an hour, over soft roads, they will draw it at the rate of 5 or 6 miles, and be subjected to no greater strain. This is all it means. The extra effort tells upon the horses, however. It is easy for a man to carry his 160 lbs. of flesh, and walk three miles an hour, but let him try to walk five, and he will find that though his weight does not increase, his labor does.

Wide-tired Wheels.

This is another point which we are very apt to over-look, greatly to our disadvantage. We suffer ourselves to be guided by wagon makers, and the wheelwright knows very well that he lives by his trade, and that wear and tear is the life of trade. He serves himself when we are suited with narrow wheels. A set of wheels with 4-inch or 6-inch rims and heavy tires, cost to make considerably more than a set 2½ inches wide; but an extra price is always put upon them. They are well worth it. A wagon or cart with a 6-inch tread, will take heavy loads over soft meadows and hardly leave a track, where a narrow-wheeled wagon with a similar load could not go at all. On country roads such broad-tread vehicles destroy ruts, and act like rollers, making the roads agreeable for light carriages, and keeping them in much better order throughout the year. It would be a real blessing to every State of the Union, to put so heavy a tax on narrow wheels upon heavy wagons and carts, that they would become quite obsolete. Millions of dollars would be saved to the people of each State, in repairs of roads, in repairs of wagons, and in horse-flesh.

Sparrows.

One of my neighbors and friends, who is a good farmer, though a Wall street lawyer, and one who thoroughly enjoys good horses, Jersey cattle, good poultry, and good crops, both in the fruit-garden and in the field, surprised me the other day, by advocating the cause of the detestible, chattering, English sparrows. I am free to confess that I may be prejudiced, but really I can not see much good in them outside of cities. Neighbor Clark says he shot one, and found its crop full of rose-bugs, and since that hour has venerated them. They do not quarrel with the bluebirds under *his* eaves. Their voice is no longer harsh and grating in *his* ears.

They are satisfied with even less fruit than *he* willingly devotes to them, and altogether they are a joy and a blessing to *him*. Well—if he can civilize and mollify this barbarous immigrant from the Old World's civilization, we may hope even for the regeneration of the slums of New York. Flocks of a hundred in the buckwheat fields were not uncommon last fall. Soon, I presume, we shall be netting them by the hundred at a cast, during the autumn, and there is one satisfaction connected with them, they are at that season as fat as balls of butter, and are said to be excellent eating, and nearly equal to reed or rice-birds. If all mankind are mistaken in supposing that they drive away other birds, we shall all be delighted, and give due honor to the discoverer of the fact. At all events, that they eat rose-bugs is sufficient to make any one regard them with friendly feelings, at least in June. For two years now we have had

A Fair Crop of Grapes.

A fact that I attribute solely to the absence of the rose-bugs. Some of the entomological people must have investigated the parasites of this insect, I think, but I have seen nothing published about it. The sudden disappearance of insect pests, when accounted for, is usually, perhaps always, found to be due to the attacks of some parasitic insect, which propagates itself in the body of the perfect insect, in the larva, or pupa, or which actually attacks and devours the pest in one or the other of its three forms of life, after it leaves the egg. If I knew this little benefactor, I would plant one grape vine in its honor, if not an acre of vineyard.

Dairy Shows.

Our Dairy Show at the Centennial was, by all accounts, as near a failure as mismanagement could make it, but the London Dairy Show at the Alexandra palace was a great success. Is it not worth while for our dairy people to make a move soon to have a June show of dairy products, processes, milch cows, and other milch animals, goats at least. I have spoken about it to a number of gentlemen interested in dairy matters, and find great unanimity in their wish that some such thing might take place. The American Dairymen's Association is really the fittest body to originate the movement and carry it forward.

Feeding Corn Stalks.

I have never, until now, been able to account for the different values various practical people put upon corn stalks. True, there is a great difference in different kinds of corn, in the way it is fed, etc., but after all, the great variation in value is caused by its dryness. That which is cured somewhat moist, even if more or less moldy, is greatly preferred by the cattle, to hard, dry, brittle stuff, which has lost almost all of its flavor, and doubtless a good deal of its nutritive qualities. Simply sprinkling the portions of stalks to be fed next, so that they will have a few hours to absorb the water, helps a great deal, but still it is not at all like having naturally moist fodder. If the water used to soften the stalks be salted, and flavored with a few handfuls of bran, this will make a great difference. No doubt the best plan to feed corn fodder, is to cut and steam it, with such additions of roots, bran, cotton-seed meal, etc., as are desirable. Few can do this; many, however, follow what is perhaps the next best plan—to cut the corn-fodder, and mix it with bran, then to pour scalding water in abundance over the mass, and cover it up with rubber sheets, or rubber army blankets, or place it in a box with a close lid, so that it shall have a good soaking and "sweating." In whatever way it is fed, it should be cut—the finer the better; but even if it be cut in foot lengths, every farmer will find his account in it. A large part of dry-fed stalks is rejected, and gets into the manure, where it is a great nuisance, first in getting it out, and then in clean culture. Those of us who can not afford to cut our corn-fodder fine, to have it "chaffed," as the English say—can at least be tidy enough to have it cut in six-inch lengths with a broad ax or a hatchet.

Reversion.—"Freaks of Nature."

A farmer showed me a curious instance of what he termed a "freak of nature"—as if nature had freaks. He had allowed a pure white Musk drake to run with some Aylesbury ducks, which had, of course, no colored feathers in them. The progeny were the most piebald, and the ring-streaked-and-speckled-est flock of "mongrels" that I ever saw. The cross brought out the hidden color, and was as clear a demonstration, as one needs to have, of the fact that there were black or colored ancestry on one or both sides. In quite a similar way we get sometimes most unexpected results in breeding—not freaks of nature—but according to laws which perhaps we do not always understand, and which form a most important subject of study. Is there a college in the land, agricultural or other, that has as yet an established chair of "Zoötechny?" The principal European schools are establishing such professorships, to teach the laws of life and of breeding. What is more important, practically, to our country? The live stock interest is the most important one connected with our agriculture. The sale of raw products is directly exhausting to the land. The sale of beef, mutton, wool, horses, and pork, indirectly so, but vastly less so. And the arts of propagating fish, oysters, and everything up to Short-horns, are too important to be left to the empyrical practice of unscientific men. The field seems to me to be as inviting as chemistry was fifty years ago, and as little worked.

Stock for Butter.

BY CHARLES S. SHARPLESS, PHILADELPHIA, PA.

The time is rapidly approaching when the quality of Jersey stock, as determined by the butter yield, must be put on record. By the butter, because a large yielder of milk may be small of butter, but a large yielder of butter can not be small of milk. In this view, the most important feature of the herd is, the *butter quality* of the bull. A bull whose daughters will yield 7 lbs. of butter (on grass alone) at two years old, is good; one whose daughters will yield 8 lbs. is better; one whose get will yield 9 lbs., is the best; but one whose daughters will yield 10 lbs., is to be classed as "A. 1," and should be secured without regard to color or black points. Take three 2-year-old heifers, the get of three different bulls, and place them in the same field, all having the same food. One allows the food to pass through her, without abstracting either fat for the ribs, or butter for the udder; the second becomes fat, while but little butter goes to the udder, but the third inherits a quality that enables her to abstract from the food, not fat for the ribs, but butter for the udder, from 7 to 10 lbs. per week. These latter constitute the butter strain; it can exist in a cow and disappear in her daughter; it can be wanting in a cow and appear in her daughter; in both cases caused by the quality inherited from the sire. Hence the absurdity, without regard to quality, of solid color or black points; we must have butter *first*, and fancy points afterwards. The opposite course has been productive of the many wretched failures everywhere apparent. It is in these respects that we see the necessity of reliable records of butter yields. The horsemen have meetings of 3-year-olds, and 4-year-olds, and the opportunity is afforded the public of timing them. As to heifers and cows, we have the statements of cow-men and owners, sometimes sworn to before Justices of the Peace, as to yields; some feeding grass only, some having 4 to 6 quarts of meal per day, some feeding all the meal the cows will eat, and some saying nothing about the feed, and none ever stating the weight of the animal.

What we need is, that the American Jersey Cattle Club shall select some reliable man, whose farm is centrally situated, to whom all Jersey cows competing for a record, shall be sent for trial. That all trials should be on grass alone; that the weight of the cow shall be stated, and her yield of butter per week shall be published in her Club Record.

This would tend to the increase, and spread of, the best butter animals, and to stop the perpetuation of the indifferent and worthless. It would save thousands of dollars, directly and indirectly, to the public, and specially to those who are willing to, and can economically pay large prices for animals, if assured of their butter quality.

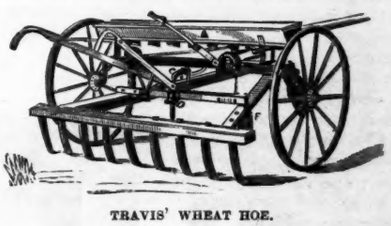
I take as a high standard for 2-year-olds, 9 lbs., for 3-year-olds, 10½ lbs., for 4-year-olds, 12 lbs., for 5-year-olds, 13 lbs., and for 6-year-olds, 14 lbs., on grass alone. I know such animals can be forced beyond those yields, and where larger yields have really existed, such forcing has taken place. But there can be no comparison so fair, so uniformly reliable, and so little calculated to injure the cow, as that based on grass alone. There is another point, very important, viz: the butter yield, say six months after calving. The cow that is a large yielder when fresh, but whose yield decreases rapidly, may be of less value than one whose yield is smaller at first, and falls off but little. A fair proportion to decrease in the first six months, would be, say one-third, so that a 12 pounder might fall to 8 pounds, or a 9 pounder to 6 lbs., in this time.

The percentage of cream increases rapidly as the yield of milk is reduced; therefore, when the percentage of cream is stated, with it should go the number of quarts of milk per day.

Now as to weight; 10 lbs. is as much butter for a cow weighing 700 lbs., as 15 lbs. is for one weighing 1,050 lbs. Jersey cows vary from 700 to 900 lbs., there are a few that, no doubt, would weigh 1,000 pounds. We must ever keep in mind that, other things being equal, the 1,000 pound cow will require more feed than the one weighing 700 lbs., perhaps as much more in proportion, as the difference in weight would indicate. A lengthy, apparently large cow, sometimes will weigh no more than one apparently smaller, but with more capacious body. The most economical cows are those on short fine legs, with neat heads and necks, but with large, full-ribbed, capacious bodies. Such have good constitutions, are easy keepers, and recuperate quickly from a reduced condition, and such, other things being equal, are the greatest butter producers for a given amount of feed.

Hoeing Wheat Crops.

In Europe, the wheat crops are always hoed, either by hand or by horse-hoes. There labor is cheap, and the hand-hoeing and weeding of an acre of wheat costs cut a trifling sum, while the return in the increased crop is very considerable. The average yield of wheat in England, for instance, is twenty-five bushels per acre, or equal to our best crops. The largest crops reported in England appear fabulous to us; 64 to 68 bushels per acre being looked for by the best farmers, as a fair yield, and anything less being considered a poor crop. Upon our richest land, the crop is much lessened by weeds, which we can not afford to destroy by hand, and we



TRAVIS' WHEAT HOE.

have no horse-hoes. A partly effective remedy is found by harrowing the wheat early in the spring, but when the growth has reached a certain point, the harrow can no longer be used. Hoes could be used, where the wheat has been sown in drills, long after the time for harrowing has passed. It is now certain that we must use every possible appliance to increase our crops, or else our profits must diminish. The tendency of values, all over the world, is still downwards, and the era of high prices seems to have passed away for the present. The period of its return can scarcely be predicted from present appearances, and an interval of many years of moderate prices may elapse, unless some unforseen event may occur to hasten it. In the meantime, we have a large scope for the improvement of our methods of farming, and increasing the yield of all our crops, but especially of the wheat crop.

It is useless to make the land rich with fertilizers if we grow weeds instead of wheat. We must, therefore, cultivate the ground, and destroy the weeds that would otherwise destroy the wheat. The horse-hoe, by which the soil between the rows can be disturbed and loosened, is the proper implement for this purpose. This is a new implement with us, and it is probable that a few attempts at its introduction may at first fail. The only Ameri-

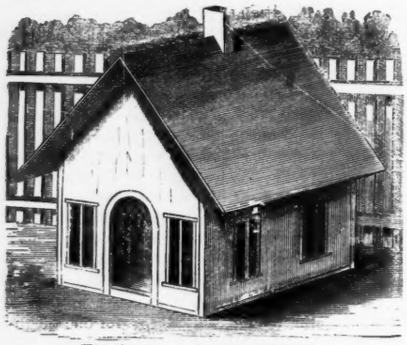


Fig. 1.—A NEAT DOG KENNEL.

can implement of this kind shown at the Centennial, was one from Michigan, exhibited by the owner and inventor, Mr. A. B. Travis, of Brandon, Oakland Co., Mich., who has experimented in hoeing wheat for 15 years, with the result of producing the implement which we illustrate. The inventor writes

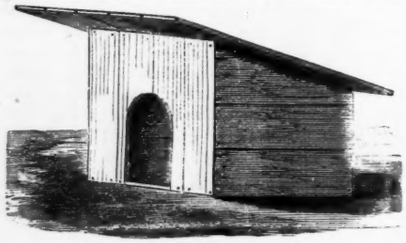


Fig. 2.—CHEAPER KENNEL.

that he has not as yet received one dollar from his invention, and as his patent expires in two years, he has small hopes of gaining anything from it, further than the satisfaction of helping to introduce a much needed improvement in wheat culture. The machine has received a medal at the N. Y. State Fair, and a diploma from the Franklin Institute. Mr. Travis offers to send a circular with full in-

Fig. 3.—KENNEL WITH YARD FOR DOGS.

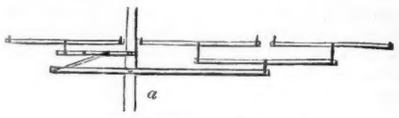
formation for manufacturing the machine, and give the free privilege of making one for experimental purposes, to any person who may apply to him. He has at last made arrangements for manufacturing them, and it is to be hoped that at least the conductors of the experimental farms in the country will test the machine, with a view to their permanent use, if satisfactory, and if not, with an effort to improve it until it can be made useful.

Dog Kennels.

In many cases, where dogs are kept, they might very well be dispensed with as worse than useless. When really of service, they deserve to be properly fed and comfortably sheltered in a kennel, placed where their watchful care is needed. Here they should be fastened at night, so that they may not be roaming abroad when they should be on the watch at home. The manner of making a very neat kennel is shown in figure 1. The bottom is 2½x4 feet, and from the bottom to top of roof 3½ feet. The door-way has an arched top and should be of any size from 8x12 inches, up to 12x22 inches, to suit the size of the occupant. It is painted a light brown, with the corners, base, and window planks painted darker. Brackets may be placed beneath the cornice molding. A cheap and equally serviceable one is shown in fig. 2. It has a floor the same size as the preceding, it is 3½ feet high in front, and the roof has a fall of 8 inches. A yet cheaper one is made by taking a square box, 2½ by 3 or 4 feet, and cutting a door in one end. During winter, if the kennel be in an exposed situation, tack a piece of heavy carpeting over the door on the inside, so that it will cover the entire doorway. Where several dogs are kept, a roomy kennel and yard should be provided, in which to confine them. The disrepute into which these animals have deservedly fallen in the estimation of sheep and poultry keepers, and gardeners, is greatly owing to the liberty given to them by their owners, of wandering about and depredating. If the owners of dogs would provide a safe place for them, and confine them there when not at work, very little injury would be done. A dog-yard and kennel is shown at fig. 3. It is roomy, so as to admit of exercise; well shaded, and is furnished with water, and a sleeping house. A water tank is indispensable, and generally there should be a bathing tank and water for drinking besides.

A Three-Horse Evener.

"L. F. P.," Salina, Kansas, sends a sketch and description of a three-horse evener, which he has used upon his reaper, thinking, however, that sometimes the one horse had to draw the most. To show that this must be the case, and the manner in which the evener is wrongly constructed, we give an engraving of the sketch. It is intended to be used upon a tongue, shown at *a*. The evener, 4½ feet long, is attached to the tongue in the usual manner, at a point which is one-third the distance from one end, leaving one part twice as long as the other. The two horses are hitched to the long end. The single horse is hitched to a bar 18 inches long, which is bolted to the tongue in advance of the evener. This bar is connected with the short end of the evener by a pair of iron straps, which are bolted to the evener and to the bar at a point 6 inches from the hammer-bolt, and 12 inches from the outer end; thus giving the horse the advantage of two to one in drawing from the outer end of the bar. At least it seems so; but it is not so really, because the straps are placed diagonally, and there is a considerable loss of power in drawing in this way, which is exerted in pressure upon the connecting bolts. But what is a more important error, the two horses have the advantage of double the length of the evener that the single horse has, thus making the draft in their favor equal to 4 to 1. Then as the single horse gains double his draft, that reduces the gain of the two horses one-half, and makes it equal to 2 to 1 as against the single horse. Thus the single horse draws against the two horses, without any benefit from the complication of levers. The suspicion as to the unequal draft is therefore a realty. To make two horses draw upon one side of a tongue, against one on the



ARRANGEMENT OF EVENER.

other side, without doubling the length of the double-tree upon the side of the single horse, or without producing a side draft, or an unequal draft, does not seem to be possible. If it can be done by any combination of adjusting levers, we should be glad to know of it from any of our readers.

A Rustic Corn-Crib.

When visiting the farm and grounds of Mr. J. Hull Browning, of Tenafly, N. J., recently, we noticed a very picturesque corn-crib, made of cedar poles and bark, which is represented in the accompanying illustration. It is not intended for an ordinary farm, but for a country place, where the necessary ugliness of the usual corn-crib may be substituted by a very pretty and picturesque effect, without interfering with the usefulness of the crib. The crib is supported by pairs of stout poles, set in the ground; each pair being jointed, and bolted firmly together, where they cross each other. A sufficient number of braces and girts, to strengthen the crib, are used, and it is covered on the sides and ends with split poles of cedar. The roof is covered with bark. If the materials are well selected, a very ornamental and unique structure is the result, and the corn-crib may be made a promi-

A RUSTIC CORN-CRIB.

nent object in the yard, instead of hiding it away, as is often done, behind an outhouse or shed.

Spreading Manure.

The winter is a good season for spreading manure. It is immaterial whether the ground is covered with snow or not, or whether it is frozen or soft, provided it is not too soft to draw loads over, and that the ground is not upon a steep hillside, from which the manure may be washed by

heavy rains, or by sudden thaws. We have spread manure upon our fields several winters, and always with advantage, not only in saving labor and time, but also to the crops grown after it, more especially to oats and potatoes. In spreading the manure, it is the best to drop it in heaps, leaving it to be spread by a man as soon as possible afterwards. This may be done most readily by using a manure hook, (figure 1), with which the manure is drawn out of the sled or wagon-box. Sloping wagon-beds are used for hauling various heavy materials, and why should they not be used for this, the heaviest and most bulky load a farmer has to handle? A

Fig. 1.—MANURE HOOK.

wagon, having the box raised, (figure 2,) so that the forward wheels would pass beneath it, would be very convenient on a farm. It could be turned in its own length, and handled with vastly greater facility than the ordinary farm-wagon, which needs a large yard to be turned in. Such a wagon could be unloaded with great ease and very rapidly, by the use of the hook, and in case it was desired to spread the load broadcast from the wagon, that could be done perfectly well. But to do this keeps the horses idle the greater part of the time, and is an unprofitable practice. Two teams hauling will keep one man busy in the yard helping to load, and another in the field spreading; the work will then go on without loss of time. In dropping the heaps,

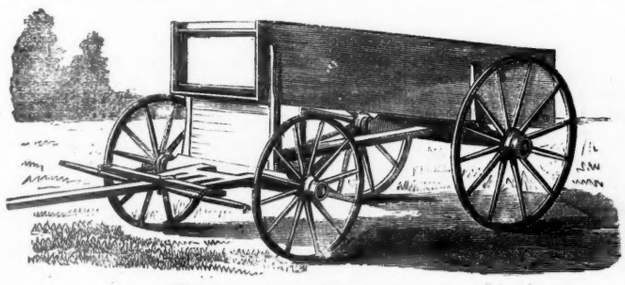


Fig. 2.—WAGON WITH RAISED BOX.

they may be left in rows, one rod apart, and one rod apart in the row; each load being divided into eight heaps. This will give twenty loads per acre. If ten loads only are to be spread, the rows should be one rod apart, and the heaps two rods apart in the rows. In spreading the manure, it should be done evenly, and the heaps should not be made to overlap. If there is one heap to the square rod, it should be thrown eight feet each way from the center of the heap, covering a square of 16½ feet, as shown in figure 3. One heap then is made to join up to another, and the whole ground is equally manured. There is more in this point than is generally supposed by farmers, many of whom are careless and wasteful in this respect, giving too much in some places, and too little in others. The consequence is uneven growth over the field, rusted grain or perhaps laid straw in some places, and in

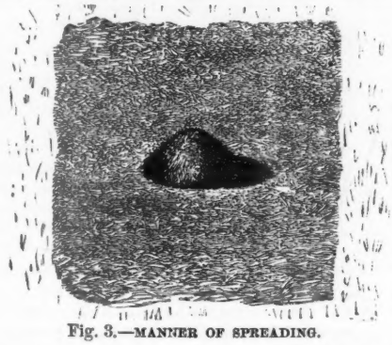


Fig. 3.—MANNER OF SPREADING.

others a half-starved crop. Another important point in spreading is, to break up the lumps, and scatter the fine manure. Unless this is done, the field can not be evenly fertilized. There is work about this, which would tempt some hired men to neglect it, but it should not only be insisted upon, but looked to, and its performance insured.

A CONVENIENT HALTER.—"C. P. B.," Rockford, Ill., sends a sketch of a halter, which fastens by a snap-hook, so that when the buckle has once been properly adjusted to fit the horse's head, it needs no unfastening afterwards. The illustration, made from the sketch, shows the manner of making the halter.

EARLY CHICKENS.—Probably nothing that can be raised on the farm can be made more profitable than early chickens. "Broilers," as they are called, or chickens of one pound weight, or thereabouts, retail in the city markets all along the spring and early summer at 75 cts. each. To sell a two or three months old chicken for the price of a first class mature fowl, cannot fail to be profitable. Those who are aware of this fact occupy themselves in raising early chickens. But as winter is unfavorable for the rearing of these tender creatures, artificial mothers must be employed. Natural methods fail at this season. Eggs can be hatched, it is true, but artificial warmth is needed for the chicks. An artificial mother must be employed. Recently we described and illustrated one of these contrivances. Many persons, experienced in poultry matters, are using incubators, and many inquiries come to us in regard to them. We are satisfied that any careful person can easily hatch and rear chickens during the winter season, by the use of an incubator, and an artificial mother, in a room heated by a stove. We saw young chickens raised in a warm room in January of last year, which were as healthy and thrifty as any. The cost of raising them at that season is certainly greater than in the summer, but there is actually less loss, the growth is more rapid, and when they are ready for market, their value is several times greater, and all these advantages compensate for the greater expense.

HALTER.

Hints and Helps for Farmers.

BY L. D. SNOOK, YATES CO., N. Y.,

HARNESS HOOKS.—A very neat and cheap harness hook may be made from the end of a plow handle, beveled as shown at *A*, figure 1. When working up the tops of oaks, or other trees, natural hooks can be procured that need only a little trimming, as shown at *B*, figure 1—these hooks may be nailed on to a beam or girt. At *c*, fig. 2, is one made from a piece of an inch board, 1 foot in length, 4 inches wide, and shaped as shown. It may be nailed on to a block, and that nailed to some part of the building, or fastened directly to the side of a post. The one at *d* is made of iron; the lower hook projects 7 inches, and the upper one 1 foot, with the hook or holding part near the end—the lower one is for the harness, the upper one for the bridle and collar, which are used first in harnessing. Where there is room, the hooks shown in figure 3 may be used. The heavy hook is for the harness, the small one for the bridle, and the other for the collar; the two small ones may be placed lower than the large one. By this plan the bridle and harness is not pulled out of shape by one hanging over the other, and one can use the harness without removing the collar and bridle.

Fig. 2.—HARNESS HOOKS.

Fig. 1.—HARNESS HOOKS.

FENCING STRAW STACKS.—Oat and barley straw has considerable value for stock feeding, and farmers should practice great economy in preserving and spending it. It is not often possible to put it all under cover, and it is necessary to stack it. If there is not a properly arranged stack yard, the stacks may be protected by building fences or pens around them. These should be safe as well as substantial, for sometimes valuable animals have been injured or killed, by running against the ends of projecting rails. In Western New York, the log pen style

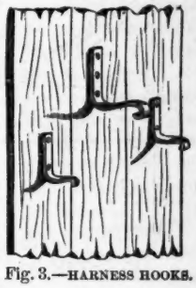


Fig. 3.—HARNESS HOOKS.

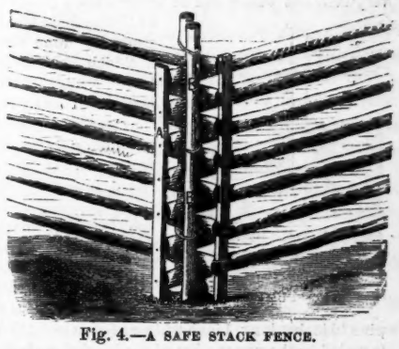


Fig. 4.—A SAFE STACK FENCE.

of fencing, as shown in fig. 5, is extensively used. The logs are from eight to twelve inches in diameter, and from twenty to forty feet in length. They

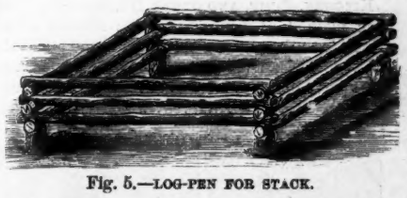


Fig. 5.—LOG-PEN FOR STACK.

rest upon blocks of wood twenty inches in diameter, and the same in length, set upon end. The straw stacked in this pen is fed out in sections by cutting down with a hay knife as needed. The same quantity of straw, thus used, will go twice as far in feeding, as if cattle were allowed to pull it out and trample it under foot; besides the danger of losing an animal or two by the stacks upsetting when partly undermined, and during one of the heavy blows of winter, is avoided. For a portable fence, or in a section where rails are more convenient than logs, the plan shown in fig. 4, will answer a good purpose. The pen may be square or any desired number of rails in length, or in circumference, and from five to seven rails in hight. Stakes are driven firmly into the ground, at each corner, and wired as shown. The ends of the rails are sawed off, and strips of board are nailed over

the ends, so there will be no possibility of animals injuring themselves by their rough and sharp points.

MAKING WOODEN EAVE-TROUGHS.—Eave-troughs should be attached to all buildings, not only as

Fig. 6.—MAKING AN EAVES-TROUGH.

a preservative of boards, timber, etc., but as a matter of convenience. Many who do not wish to go to the expense of tin eave-troughs, may make troughs of straight saplings of pine, chestnut, or cedar, and can in a few days' time, during the leisure of winter, make enough eave-troughs to supply a farm. A round straight stick from 15 to 40 feet in length, from 4 to 6 inches in diameter at the but, and 3 to 5 at the top, is readily converted into a trough. First, strike a chalk line, and hew a little over one-third of the stick away from the straight side; then place the flattened side up on the trestles. On one of these I nail, at each side of the trough, a block the same hight as the trough, and over the top place a strip, nailing it fast to each block and the top of the trough. Any one skillful with the adze, can dig out a trough very fast, but others can do better with a common ax. The finishing is generally done with a 2-inch chisel or large gouge. The manner of attaching the troughs to a building, (shown at figure 7), is by a board bracket made to fit the outside of the trough; this is nailed to a cleat, which in turn is nailed to the side of the building. A piece of pine 10 inches long, 1 inch wide, and ¼ an inch thick, is nailed to the upper edge of the bracket and over the trough, to hold it in position. When finished it should be seasoned thoroughly in the shade, and be painted two coats both inside and out.

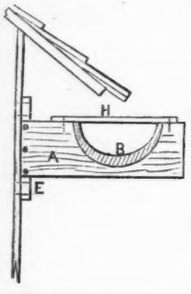


Fig. 7.—BRACKET.

Fig. 8.—PUMP DRAIN.

KITCHEN, PUMP, AND OTHER DRAINS.—The common method of disposing of the kitchen slops, which is to throw them upon the ground about the back door, is a very unwholesome practice, and productive of much disease. It is but a few hour's work to construct a drain by which all the waste

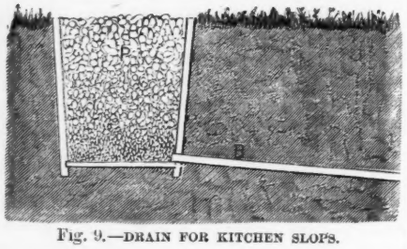
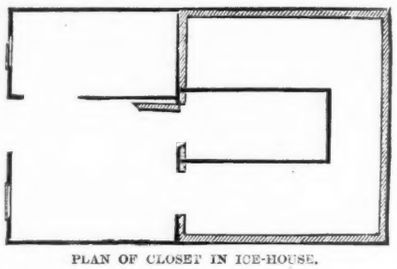


Fig. 9.—DRAIN FOR KITCHEN SLOPS.

may be carried off. A wooden box, 18 in. square, and about 2 ft. deep, is set into the ground near the kitchen door, and filled in with round stones from 1 to 2 in. in diameter; an outlet pipe, 2 or 3 in. in diameter, square or round, and of either wood or metal, is fitted to the bottom of the box, as shown at figure 9. This is intended only for water, vegetable refuse should find its way into the pig-trough. A drain for the waste of a pump (fig. 8) is made thus: at the lower edge of the platform, in front of the pump, is placed a funnel-shaped wooden box, about 6x10 in. square at the top, and 4 in. square at the bottom. This is connected with a wooden discharge pipe. The waste from the pump is carried off by this pipe, and the ground kept dry.

Ventilation of a Closet in an Ice-House.

A correspondent in Colorado sends the description of a meat-closet, which he contemplates making in the center of an ice-house, so that it will be surrounded with ice. The proposed refrigerator is shown in the accompanying engraving. The trouble is with respect to ventilation. This is a difficult matter to provide for, as a current of air, passing through the closet, will cause a considerable waste of ice, and will moreover introduce much moisture into the closet, where it will be condensed. The effort should be made to keep the air in the closet as dry as possible, as moisture greatly hastens putrefaction of animal substances, and dry air preserves them. A ventilating pipe may, therefore, be made to pass out from the top of the closet, but should be kept tightly closed, excepting when its use is imperatively required, when it may be opened on a cool night. At other times the moisture in the closet should be absorbed by the use of charcoal or fresh lime, hung up in a bag of some open fabric. The charcoal may be freshened occasionally by by drying it and baking it in a hot oven.



PLAN OF CLOSET IN ICE-HOUSE.

The Marks of a Good Milk Cow.

To know how to select a good cow is a necessary part of the education of a farmer, and more especially of a dairyman. A competent judge of a cow should be able to select at sight the best milkers from a drove, and the points in which such cows differ from others, are so marked and conspicuous, that it should be very easy to know them. The head is the first thing that attracts notice. In a good cow this should be fine in the muzzle, deep in the jaw, broad between the eyes and between the jaws, and with large nostrils. The eyes should be large, mild, bright, and active, but n ervous and restless, and the membranes should be bright red and full of blood. The ears should be deep yellow inside, and the waxy secretion should be plentiful, and of a deep yellow color. The horns should be fine and thin, yellowish in color at the points, and very clear and waxy in the texture of the surface. The neck should be slender and tapering, with a capacious windpipe; the dewlap should not be prominent or fleshy, and the point should show a yellow color. The chest should be broad and roomy, giving plenty of room for the play of the lungs, but not deep. The chine should be thin, and the back level, widening out across the hips, where it should be broad and flat. The body should be deep in the belly, gradually tapering from the shoulders backwards; the ribs should spring out well from the backbone, and there should be ample space between the last rib and the hip. The shoulders and thighs should be thin and narrow, the legs fine in the bone, and not of great length; the hoofs should be clean and clear, with a waxy surface. The pelvis should be broad, and the tail should be set pretty high above it, lying well down between the prominent bones, and should be thin and long, reaching down near to the ground. The udder should be large, loose, and squarely formed, with the teats placed well apart from each other, should come well forward and well up behind, where, when empty, it should hang in loose folds. The milk-vein should be large, and also come well forward; the veins of the udder should be abundant, the skin a deep yellow color, and covered with short, soft, fine hair. The teats should be long, and of such a size that they can be handled in milking with ease, the milk should flow readily, and with gentle pressure. The skin of the whole body should be loose and elastic, of a yellow color, and covered with abundant soft, silky hair. The color of the hair may be ignored, as a general rule, although we have found cows that have been the darkest in color, have given the richest milk; this, however, seeems to be a point that has not yet been determined. The escutcheon is a point that is greatly dwelt upon by many experts in dairy matters, and as some distinct inquiries have been made about it, we refer to this at length with our most recent observations. The "escutcheon" is the reversed growth of hair that is found upon nearly all cattle, from the thighs and udder, upwards. The peculiar form of this escutcheon, or "milk mirror," is supposed to denote the value of the cow as a milker, both as to the quantity yielded, and the continuance of the yield. It was discovered by a Frenchman, M. Guenon, a dealer in cattle, who had observed the differences in the forms of the escutcheons of a great number of milch cows, and the corresponding difference in the milking capacity of the animals, and he attempted to reduce these differences to a system. His discovery was tested many times in France, and in recognition of its value the French government, about 40 years ago, conferred a pension upon him. Since then a good escutcheon has been considered as one of the characteristic points of a good cow. A full description of M. Guenon's theory, and the rules for judging cows by it, which he built up after many years study and observation, is given and amply illustrated in a book entitled "Guenon on Milch Cows," published by the Orange Judd Company.

Fig. 1.
GUENON'S ESCUTCHEON.

Mr. Guenon divides the escutcheons into eight classes, each of which is characterized by a different form, and each class is divided into eight orders; these orders being graded from best to worst, as the peculiar class of escutcheon decreases in size or degenerates in character. The first order of the first class escutcheon is given in figure 1, as it appears in the book referred to. This is taken to be the mark of the best milk cows, which yield over 20 quarts of milk per day, and never go dry if they are continuously milked. As the quality of the cow decreases, the size of the escutcheon diminishes. From many observations of premium milk cows, exhibited at the State fairs for some years past, we have found the escutcheon to be very variable, and in few cases to approach the classification of M. Guenon. For instance, from amongst all the cows exhibited at several State fairs in 1874, as large milkers, we could only select one whose escutcheon came near to the standard to which it ought to belong. This was in the case of a cow exhibited by the

Fig. 2.—BOYDEN FARM COW.

Boyden Farm, Irvington, N. J., which was said to have milked 6,500 quarts in 347 days. The escutcheon of this cow, given in figure 2, is taken from a sketch made at the time she was exhibited. At figure 3, is given the escutcheon of Maggie Stewart, a prize Ayrshire cow, imported from Scotland by Mr. Wm. Crozier, Northport, N. Y., whose portrait was given in the *American Agriculturist* of January. This cow milks 26 quarts when fresh, and, if permitted, will continue to milk until she calves. We have found many other good escutcheons upon first class cows, but many more first class cows having escutcheons that do not come up to the standard. In grades, the failures are most numerous, and while the truth of Mr. Guenon's theory may be conceded to some extent, as regards cows of a pure and distinct breed, yet as regards cows of mixed blood it is doubtful. On the whole, it may perhaps be safe to conclude that if the escutcheon is possessed by a cow having all the other marks of a first class milker, it is to be taken as additional testimony as to her capacity, but the escutcheon alone, in the absence of other marks, cannot be depended upon. Nor is a cow, that possesses all the other marks of good character, to be rejected solely because the escutcheon is not of the first class or order. Those who would study this subject, which cannot be presented in full or in convenient form in a journal, are referred to M. Guenon's book, with the title above given.

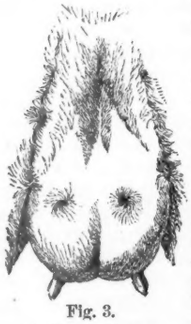


Fig. 3.
MAGGIE STEWART.

Plan for a Poultry-House.

The plan here given, for which we are indebted to J. M. N. Reed, Erie, Pa., is arranged for keeping two different breeds of fowls. The elevation is shown at figure 1, and the ground plan at figure 2. It is 8 x 20 feet on the ground, 10 feet high in front, and 7 feet in the rear; it is divided into two roosting and laying rooms each 8 ft. square, and a room for sitting hens and collecting eggs, 4 ft. by 8. These apartments are separated from one another by slatted partitions, and communicate by means of a door placed in each partition, just over the boxes, the top-board of the nests being used as a step to the door. The open work partitions allow the free passage of air to all parts of the house. There is a window in each roosting-room, of six 8 x 10 panes of glass; a small sliding door opens from each room into the yards. From the sitting room there is a door two feet wide, opening to the middle yard, where the young broods are confined. This yard should be made close, to prevent the chicks from getting out; it should also have laths over the top, to prevent cats from getting in. Two roosts run the length of each roosting-room, and two others should be placed low down in the sitting-room, out of the way of the doors, these latter roosts which are not shown in the plan, are for the young chickens to roost on before they are old enough to be put with the other flocks. About six inches below each roost is placed a board one foot wide, with strips tacked on the edges, projecting two inches above the upper side of the board,

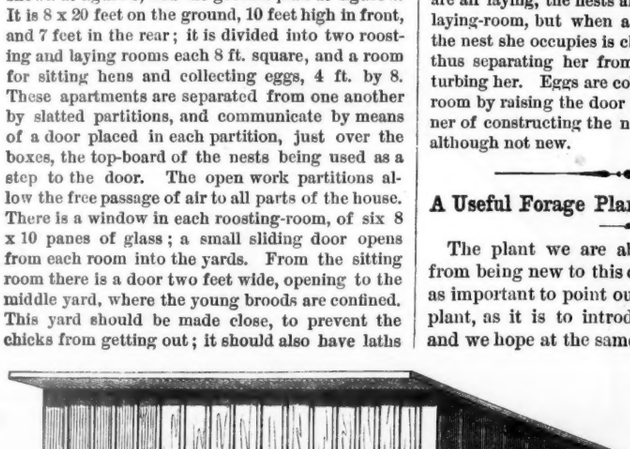


Fig. 1.—VIEW OF POULTRY-HOUSE.

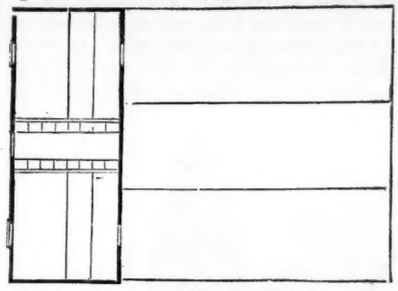


Fig. 2.—PLAN OF POULTRY-HOUSE AND YARDS.

to catch the droppings, thus securing a clean place to feed the fowls in winter, and for them to scratch in. The nests consist of two boxes, each 8 feet

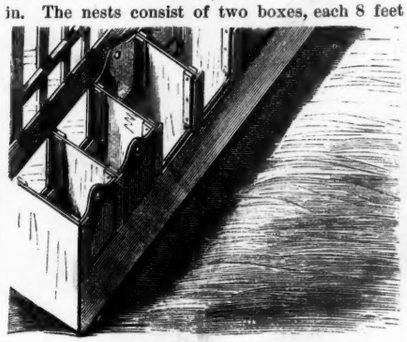


Fig. 3.—ARRANGEMENT OF NESTS.

long, 14 inches wide, and 18 inches deep, and divided into 8 nests. These are placed along each partition inside of the sitting-room. Figure 3 shows the manner of constructing the nests; a board nine inches wide is placed along each side of the box, leaving an opening 9 x 11 inches on each side of every nest, one opening into the laying-room, the other into the sitting-room, one of these is always closed by means of a sliding door. When the hens are all laying, the nests are kept open towards the laying-room, but when a hen broods, the door of the nest she occupies is changed to the other side, thus separating her from the others without disturbing her. Eggs are collected from the sitting-room by raising the door of each nest. This manner of constructing the nests is an excellent one, although not new.

A Useful Forage Plant—Durra—Sorghum.

The plant we are about to describe is far from being new to this country, but it is quite as important to point out a new use for an old plant, as it is to introduce an entire novelty, and we hope at the same time to clear up some of the confusion of names by which it has become surrounded, in part the result of accident, and in part by persons who would sell an old plant under a new name. As the most appropriate among the several common names of the plant, we select *Durra*, for reasons to be given presently. Botanically it is *Sorghum vulgare*, probably a native of Africa, but it has been in cultivation, especially in Eastern countries, so long, that its origin is not certainly known. *Sorghum vulgare* is a remarkably variable species, nearly as much so as Indian Corn—indeed in some respects more variable. For though the Maize differs wonderfully in size and color, its uses are the same, while Sorghum, having been long cultivated for quite different purposes, presents distinct races, that are grown for distinct uses. Thus in Africa, and parts of India, it is cultivated for its grain, which is largely consumed as food, and some tribes or communities depend largely upon it for sustenance. It has also been cultivated for food in southern Europe, and other warm countries, as "Indian Millett," and under other names, and a number of grain-bearing varieties, differing in the size and shape of the head, and color of the seed have been the result. In China, and Cochin China, where rice forms the chief farinaceous food, Sorghum was little needed for its grain, but attention being directed to the sweet juice of its stalk, it was cultivated to develope its saccharine qualities only, to the neglect of the grain, hence several sugar yielding varieties were in time established, the number of these increased still more in the islands of the Pacific, and in Africa also several of these sweet stalked varieties are known. A number of these sugar, or rather syrup-yielding Sorghums, have been introduced into this country, and are still more or less cultivated as Sorghum or Sorgho. Still another race, or set of varieties, valued for neither their grain, nor their sweet juice, but solely for the long, fine, elastic branches to the flower cluster, are known as Broom-corn. In the grain bearing Sorghums, the branches of the panicle or flower-cluster are but little over an inch long, and these are stout and thick, to bear the weight of seeds, while in the finest broom-corn, these reach a length of 20 inches or more, and very slender. Where the selection and cultivation with a view to develop this peculiarity first commenced, is not well known, but this country has done much to improve it, and the Broom-corn of the present day is greatly superior to that of 50 years ago, a marked change having been wrought in the plant within the observation of many now living. Many of our readers may find it difficult to conceive that the Indian Millett, the Sugar Sorghum, and Broom-corn, are all forms of one and the same plant; botanists have endeavored to separate them, and to make three or four species; there is much confusion in regard to them in the older botanical works, for the reason that there are no good distinctions by which to separate into several species what are really but one. It is true that the three races are unlike, perhaps more in uses than in appearance, but not so much unlike as the kale, cabbage, cauliflower, and kohl-rabi, which people generally accept as being merely forms of the same plant. Leaving the Sorgho and Broom-corn varieties out of the question, we would call attention to the grain producing form, which besides "Indian Millett," has also been called "Great Millett," "Guinea-corn," "Negro Guinea-corn," and "Chocolate-corn," for English names; it has also a set of African names: "Durra," "Doora," "Doura," "Dora," "Dana," "Jowaru," and "Jondla." As the plant is likely to attract some attention, we prefer—among all these names—to call it Durra. There are already two well known millets, which make confusion enough with the name, without adding a third. "Guinea-corn" has already been confounded with "Guinea-grass," a related, but entirely different grass. "Durra," either by itself, or "Durra-corn," is a name already known for the plant in some localities, and one to which we see no objection. We prefer simply Durra to Durra-corn, as we can see no need of two names when one will answer.

Durra, like Broom-corn, varies in hight with the richness of the land; under favorable circumstances growing from 10 to 15 feet high. It is more thickly furnished with foliage than the Broom-corn varieties, and the leaves are so like Indian corn that it is difficult to tell them apart. The flowers, and seed, are borne in a single panicle, or cluster, at the top of the plant; this differs somewhat in shape, in some being cylindrical, in others pyramidal; it is sometimes exceedingly close and compact, and in others more open and loose, usually about 6 inches long and 2½ inches through the largest part. In one variety, known in Europe, the head in ripening bends directly downwards. The engraving shows the general habit of the usual form of the plant. As the structure of the flower cannot be well described without detailed analyses, it is sufficient to say that it it is like that of Broom-corn. The grain is small and roundish, and it is of a dead white, reminding one of pearl-barley; in some varieties it is yellowish or even brownish. The grain, while it is much used as food in some countries, is regarded as less nutritious than most grains, from the lack of albuminoids.

DURRA, OR COMMON SORGHUM.—(*Sorghum vulgare.*)

For the past two years there have been discussions in the Southern journals, concerning the value of Guinea-corn and Guinea-grass as forage, the correspondents evidently talking about different plants; the writers often not knowing that they were describing different things, often found themselves in much confusion, but as it was apparent that the term Guinea was prefixed to one, if not two, valuable forage plants, and that there was a Guinea-grass or Corn different from the plant we had collected in Georgia as Guinea-grass, we took measures to get at the facts in the case. Quite unexpectedly, Mr. David Reid, of Pensacola, Fla., but at present in Washington, sent us specimens of both plants, though he made no confusion of names, one being marked "Guinea-grass" and the other "Durra"; the latter is the "Guinea-corn" in question. As the Durra, *Sorghum vulgare*, is now attracting attention as a forage plant in the Southern States, we requested Mr. Reid to give us his method of cultivation. He sent us a very full account, and is very enthusiastic over his success with it; but he wishes it to be understood that he speaks of it only from his experience in Florida, and does not wish that accepted as an indication of its value in northern localities. How far North it may be found profitable, or if it may successfully compete with Indian Corn as a forage crop, can only be decided by experiment. We abridge Mr. R.'s notes: For the best results, Durra needs a warm and rich soil; the land should be well prepared, and liberally manured; it is then laid off in beds, to allow of surface drainage, and the seed sown in drills, which are from 2 to 3 or 3½ feet apart; the poorer the land, the more room must be given; on rich soil, the drills are as close as can be worked with a cultivator; the seeds are dropped at 3 to 4 inches apart in the drills. Like Sorgho and Broom-corn, the seed is slow in germinating, unless the soil is warm, and the young plant so small, that it might be mistaken for a spear of grass. When young, it needs careful working; any method found useful for Broom-corn will answer for this, but while the plants are young, they must be kept free from weeds, by the use of hand-hoes and weeding; after the first clearing, the crop receives the same treatment as Indian Corn, and as with that, the weeds must never get the ascendency. When the plants are 6 to 10 inches high, and have begun to throw up suckers, of which each plant forms a bunch of four to six, they are thinned to 8 to 10 inches between the bunches. At this time, any vacant spaces from failure of seed to germinate, may be filled by transplanting from spots needing thinning. Mr. R. states that it pays to utilize all the thinnings, by setting them in prepared rows, thus transplanting a part of the crop, doing it carefully on a warm wet day. A portion of the crop, or a special patch, is reserved for seed, and is not to be cut for fodder. When the seed-bearing plants are about 5 ft. high, the clumps are thinned, cutting out all but three or four of the best stalks, and using the thinnings as forage; as other shoots appear, they are also cut out. When the grain is in the milk, the lower leaves, to 5 or 6 ft. from the ground, are removed, to admit the sun to the roots to assist in maturing the seed. When the seeds are ripe, the heads are cut, and put under shelter to cure thoroughly; if not well cured, they are apt to be attacked by insects. For forage, the cutting begins when the plants are 3 to 5 feet high, and continues every 25 or 30 days, until frost; the plant throws up additional shoots after each cutting, if properly cared for; the stalks are cut within two inches of the ground, and the crop must then be kept clear of weeds until the new growth gains the ascendency over them. In Florida Mr. R. planted about March 18th, and commenced cutting in about 60 days; up to Sept. 1st he had made five full cuttings, the united lengths of which he estimates at full 20 feet; he mentions no cutting beyond Sept. 1st, as he was then obliged to come North on account of ill health, and his patch was turned into a pasture. Mr. Reid is confident that, for the Southern States, on rich land, the Durra will exceed in value all other forage plants. A consideration of the value of Durra as a grain crop must be postponed until another time. If used for this, or any other purpose, it should be under its proper name. Not long ago the Durra was offered as "Ivory Wheat." To judge from the description and engraving, a variety of it is this year offered under the absurd name of "Pampas Rice."

The Umbrella Pine of Japan

(*Sciadopitys verticillata.*)

Though the Umbrella Pine was described nearly a century ago by Thunberg, who regarded it as a species of Yew, it was not known in European gardens until 1860, when it was introduced by Fortune. It was first correctly described and figured by Siebold and Zuccarini in their Flora of Japan, (1834), who recognized it as a new genus, to which they gave the name *Sciadopitys*, from the Greek words for umbrella and pine-tree; on account of the peculiar arrangement of the leaves and branches, they called the species *verticillata*. Siebold, who saw the plant only in cultivation in the gardens and in the grounds around the temples, described it as growing only 12 to 15 ft. in hight, but according to later travelers it reaches from 80 to 150 feet, and is one of the grandest of all forest trees. The branches are alternate or whorled; the leaves are flat, about one-sixth of an inch wide, and about four inches long, are arranged in whorls of 30 or 40, at the ends of the branches, each whorl spreading and assuming an umbrella-like form. The leaves last three or four years, and the young branches show a succession of several such whorls separated by spaces equal to the annual growth of the stem. The male and female flowers are probably upon different branches of the same tree, the latter ripening into a cone the year after flowering; the cones are about three inches long and half as thick, cylindrical, and composed of very thick, broad scales, between which are equally broad bracts, each scale bearing six to nine seeds. None of the conifers from Japan have been watched by cultivators with more interest than this. At first it was quite too rare and costly a plant to allow its hardiness to be generally tested; we have known for several years of a specimen near Philadelphia, which has stood the winters there, but as that locality seems to be the northern limit of many things, this single case could not be taken as an indication of its behavior farther north. We were especially pleased to receive from Mr. Charles H. Hovey, of Hovey & Co., Cambridgeport, Mass., a photograph of the tree from which our engraving is made, and the following notes which seem to put the question of its hardiness beyond a doubt. Mr. Hovey writes:

"This new conifer cannot be too highly recommended, should it continue to withstand the climate as successfully as it has done in the vicinity of Boston for the last four very severe winters. We have a specimen which has stood out during that time, without the slightest protection, and it has not received the least injury to any part of its branches. Mr. Wm. Gray, Jr., has also a specimen which has been out about the same time, which has also been without protection and without injury. Our plant is now about five feet high, and from its peculiar habit is noticeable among all the other conifers. It may well be a favorite with us, as it is with the Japanese, on account of its distinct and striking appearance, and now that its hardiness seems to be established, it will no doubt be generally grown."

From what we have seen of the tree we can heartily second Mr. Hovey's commendation. With most conifers, their power of endurance increases with age, and many that are hardy when well established, require protection when first planted; that this endures the winter when quite small, gives excellent promise for its future. Those who have a place for a single choice, striking evergreen, or for only a few varieties, should consider the Sciadopitys in making a selection. According to Siebold, the Japanese have several varieties, and the French catalogues mention one with the foliage marked with yellow blotches, but we can not conceive this to be any improvement upon the rich green of the ordinary form, and it is too dignified a tree to indulge in any such vagaries.

UMBRELLA PINE OF JAPAN.

MENTZELIA ORNATA.

The Mentzelias as Garden Plants.

The genus *Mentzelia*, named in honor of Mentzel, an early German botanist, is peculiarly a North American one; it contains about 30 species, all but two of which belong beyond the Mississippi. Among these, a number are of merely botanical interest, while several are remarkably showy plants. Nuttall, regarding some of them as sufficiently distinct, placed them in a separate genus, which he called *Bartonia*, in honor of Dr. B. S. Barton, of Phila-

delphia, one of the early American botanists. When these plants were carefully studied by Torrey and Gray, they found no good distinctions to separate Nuttall's *Bartonia* from the earlier *Mentzelia* of Linnæus, and besides Barton's name had already been previously applied to another, and quite different plant, and it had to be dropped. This is a matter of regret, as we should much prefer to have the name of Barton borne by some of the finest of our native plants, than as now, by some of the most humble, but such matters are not governed by preferences, but by rule. The name *Bartonia* is still continued in the seed catalogues, for plants which are properly Mentzelias. As many persons, even some who have passed their lives in the cultivation of plants, cannot understand why a name once given to a plant should not be retained by it ever after, we give the above bit of nomenclature to show that these changes are not matters of fancy, and are never made—at least never by botanists of eminence—without sufficient reason. In this case there are two reasons, either of which would suffice: firstly, the plants which Nuttall called *Bartonia* are not distinct from *Mentzelia*, and secondly, Muhlenberg had given Barton's name to a little Gentian-plant, about a dozen years before Nuttall applied it to the plants in question.

The Mentzelias belong to the Loasa Family, which need not be described, except to say, that they are herbs, often with stinging bristles, and related to both the Evening Primrose Family and to the Cactus Family, in some respects. The genus *Mentzelia* includes annuals, biennials, and possibly some are perennials, with alternate, mostly lobed leaves, which, as well as the stem, are clothed with rough bristles. These bristles, by the way, are in some species most interesting objects for the microscope, as they present a great variety of elegant and curiously formed hooks and barbs. The yellow or white flowers have from five to ten petals, and many stamens, all upon an ovary which ripens into a few- or many-seeded pod. *Mentzelia Lindleyi*, which is "Bartonia aurea" of the catalogues, is an annual from California, one to two feet high, with bright yellow five-petalled flowers, opening in sunshine, and is a pleasing plant. The finest species of all is *Mentzelia ornata*, a biennial, if not perennial. It grows four or five feet high, branches freely, and bears large creamy-white flowers which open at sunset, or earlier on a cloudy day. The engraving, being much reduced in size, while it gives the shape, fails to convey an idea of the exceedingly showy character of the flower. There are ten petals, at least two inches in length, rather firm and papery in texture, and within these there is a crowd of 200 or 300 stamens, remarkably long, erect, and stiff, giving the flowers somewhat an artificial look, and from the number of stamens they resemble some cactus flowers. They are very strongly, and pleasantly fragrant. This species is called *ornata*, meaning furnished, on account of the leafy bracts beneath the flower. A related and similar species, with flowers about half the size, is without the bracts below the flower, and is called *M. nuda*, or naked *Mentzelia*, and though greatly inferior to the other seems to be better known in cultivation. Both species are found in Nebraska and southward. Though biennials, they will, if the seeds are sown early under glass, bloom the same year, but their flowering will be much later than if sown in August or September, to bloom the next year. It would be safer to winter the plants in pots in a frame, but if left in the open ground they should have a dry spot, as there is danger that their fleshy roots may decay if too wet. The plant branches freely, and should not stand closer than three feet. The English horticultural journals notice the failure of *M. ornata* to flower with them, their climate being too cool for it—a marked contrast with our own success last summer, when a row, 50 ft. long, was towards sunset sheeted with bloom, and presented a sight worth going far to see. A correspondent of the "Garden" quotes a Dr. Bell as authority for the statement that the plant is "called by the ranchmen the Prairie Lily," a name that we have not before heard for it, and which is such a thorough misnomer that it should be suppressed. The same author states that the odor is oppressive and causes violent headache, a peculiarity we have not noticed, and probably like many other odors it unpleasantly affects only certain individuals.

How Flowers are Fertilized.

BY PROF. ASA GRAY.

ARTICLE X.—THE BUSY BEE.

The season of flowers had passed and winter was upon us before we could reach the most curious and special of all the arrangements by which insects are made to fertilize blossoms, namely, that in which they carry all the pollen of a flower in a mass from one plant to another. This is just what is done in two large families of plants, viz.: the orchis and the milk-weed families. They are widely different from each other in other respects, but they agree in this. Perhaps, when the season comes round, we may take some of these cases in hand. But for the present we have had cases enough, and in sufficient variety, to raise several serious questions. First of all, what is the good of cross-fertilization? To impart new vigor, is the answer that we have all along given. But where is the proof that crossing does invigorate? Moreover the cases in which flowers must needs be cross-fertilized, shade off into those in which they merely may cross now and then, and are matched by another kind of case, in which they must self-fertilize. If, on the one hand, many blossoms are as plainly adapted for cross-fertilization "as the teeth and talons of a carnivorous animal are adapted for catching prey," we must admit that there are others in which self-fertilization is just as clearly aimed at. How are these cross purposes in Nature to be reconciled? Then, how and why does crossing give new vigor? In most plants—at least in large herbs and in trees and shrubs, with their hundreds and thousands of flowers—the most likely crossing is that of blossoms on the same tree, or the same branch or cluster. Is such near crossing as serviceable as that between the flowers of separate plants? And if not, why not? Finally, considering the multitude of flowers which most plants bear, and the short time each is in blossom, is it at all likely that most or many of those which are said to need help will actually be visited by insects?

Now most of these questions have been taken up and answered by Mr. Darwin in a book just published, entitled "The Effects of Cross and Self-Fertilization in the Vegetable Kingdom." Our readers will be interested to know what Mr. Darwin has to say upon these questions.

We take the last question first; and cull the following from the XIth chapter of this new book, which treats of "the habits of insects in relation to the fertilization of flowers."

In this kind of work, and in other respects, bees are the most knowing and the most useful of insects. "All kinds of bees, and certain other insects, usually visit the flowers of the same species as long as they can, before going to another species." It appears that Aristotle observed this with respect to the hive-bee more than 2,000 years ago! It does not hold true without exception, but is generally true. This is very good for the flowers, as it greatly favors the cross-fertilization of distinct individuals of the same species, and avoids waste of pollen. But why do the bees do it? To save time. They have just learned how to stand in the best position on the flower, and how far and in what direction to insert their proboscis; and so they will work much quicker than if they were to take different flowers promiscuously, each kind requiring different management. This explanation was hit upon independently by Mr. Darwin and H. Müller. "Humble and hive-bees are good botanists; for they know that varieties may differ widely in the color of their flowers, and yet belong to the same species." They have been repeatedly seen to go straight from a red Fraxinella plant to a white one, from a dark purple Pansy to a bright yellow one, etc. This is the more curious, because Lubbock has shown that bees distinguish and are very much guided by colors; and when Mr. Darwin cut away the blue petals of *Lobelia Erinus*, and Mr. Anderson, the corolla of a *Calceolaria*, the bees ceased to visit them. That color is not the only guide is also shown by bees flying straight from one clump of a yellow Evening Primrose to every other clump of the same plant in the garden, not turning aside to Eschscholtzia—flowers which they passed close by. But how did the bees discover that red and white Fraxinellas belong to the same species? They probably have a keen sense of odors, and Fraxinellas are strong-scented; but that will not explain the remarkable fact, vouched for by H. Müller, that bees collecting pollen from primroses, "invariably passed by the flowers of the long-styled form, in which the anthers are seated low down in the tubular corolla. Yet the difference in aspect between the long-styled and the short-styled forms is extremely slight."

The industry of bees is proverbial. But some of the facts, which Mr. Darwin has himself observed, give us a still higher idea of it. They appreciate the value of time. When flowers, such as Columbines, have several nectaries, if they find one exhausted by other bees, "they do not try the others, but, as I have often observed, pass on to another flower." "Humble-bees fly at the rate of ten miles an hour." Does any one know the rate at which hive-bees fly? As to the number of flowers visited in a given time, Mr. Darwin observed that in exactly one minute, a humble-bee visited 24 flowers of *Linaria Cymbalaria;* another, 22 flowers of Snowberry; a third, 17 flowers of Larkspur on two plants. Watching a single flower of Evening Primrose, he saw it visited eight times in 15 minutes by several humble-bees, and, in following the last of these bees, he found that in a few additional minutes it visited every plant of the species in a large flower-garden. In one minute, six bell-flowers were entered by a pollen-collecting hive-bee, although gathering pollen is much slower work than sucking nectar. Within ten minutes seven flower-stalks of a Fraxinella were visited by 13 humble-bees, each of which entered many flowers. A few days afterwards, the same plant was watched for ten minutes, and 11 humble-bees visited the flowers. Mr. Darwin computed that each flower of this Fraxinella must have been visited at least thirty times a day, and the same flower keeps open during several days. From these examples we learn what efficient fertilizers bees must be.

A few words about the habit which some bees have of taking their wages while shirking their work. In all honey-bearing blossoms there is a proper mode of access, which most insects avail themselves of according to their ability and opportunity. But bees are very apt to enter in some other way, especially by perforating the tube or base of the corolla. Almost every one has observed this in bean blossoms, and here the structure of the flower is such that the larceny may save time; and the same may be said of red clover, in which occasionally most of the blossoms examined are found to have been perforated and rifled. But it is also done in simpler flowers, where it would seem that the nectar might be honestly come by with quite as little trouble.

As far as Mr. Darwin knows, it is always humble-bees which bite the holes; but hive-bees are quick to take advantage of it,—and not slow to learn the trick, it seems, for H. Müller has seen them bite

holes in the corolla of a heath. Mr. Darwin records the following observation, made twenty years ago, and published at the time in the "Gardeners' Chronicle." "I was led to observe, during some weeks, several rows of the scarlet Kidney-bean, whilst attending to the fertilization of this plant, and daily saw humble and hive-bees sucking at the mouths of the flowers. But one day I found several humble-bees employed in cutting holes in flower after flower; and on the next day every single hive-bee, without exception, instead of alighting on the left wing-petal, and sucking the flower in the proper manner, flew straight and without the least hesitation, to the calyx, and sucked through the holes which had been made only the day before by the humble-bees; and they continued this habit for many following days.—Now how did the hive-bees find out so quickly that holes had been made? Instinct seems to be out of the question, as the plant is an exotic. The holes cannot be seen by bees whilst standing on the wing-petals, where they had always previously alighted. From the ease with which bees were deceived when the petals of *Lobelia Erinus* were cut off, it was clear that in this case they were not guided to the nectar by its smell, and it may be doubted whether they were attracted to the holes in the flowers of the Phaseolus by the odor omitted from them. Did they perceive them by the sense of touch in their proboscides, whilst sucking the flowers in the proper manner, and then reason that it would save them time to alight on the outside of the flowers and use the holes? This seems almost too abstruse an act of reason for bees; and it is more probable that they saw the humble-bees at work, and understanding what they were about, imitated them, and took advantage of the shorter path to the nectar."

Why do bees gnaw holes when they might get the nectar in the regular way?—No doubt to save the time of climbing in or out of the larger flowers, or of crowding their heads or tongues into narrow passages in small ones. From observation of insects working either way in certain flowers, Mr. Darwin judged that they could visit nearly twice as many in the same when they sucked through the perforations. But then much time must be lost in making the holes, especially when they are cut through both calyx and corolla. So the boring would hardly pay except where flowers grow in great numbers of the same sort together. And Darwin says he was long ago struck with the fact that it is only under such circumstances that humble-bees perforate flowers. If this is so, no species is likely to run out for want of crossing through this injurious habit of bees. For as long as the flowers are very plenty, a sufficient number will get cross-fertilized; and whenever they become scarcer, the bees, no longer stimulated by the abundance to work in the surreptitious wholesale way, will enter the flower in the legitimate manner.

Does any one know of an instance of the perforation of any fugacious flower, any which lasts only one day? If no such case occurs, it will confirm the suggestion that the perforations are made to save time, and show all the more what keen and sensible observers bees are.

Cheap Greenhouses—How to Heat them.

BY PETER HENDERSON.

In the *American Agriculturist* for November, 1874, I described and gave a diagram of a method of heating a greenhouse, 20 feet wide by 100 feet long, by the ordinary smoke-flue and with only one fire. Heretofore it had been generally believed that it was impossible to heat a structure of that size with but one furnace, and few ever risked a house more than one-third of the size with a single fire. The principle there described, although not a new one (as I afterwards ascertained, as it had been recorded in the transactions of the London Horticultural Society some 50 years before), had certainly never been generally practised, and its publication in the *American Agriculturist* has created a great deal of interest, and has involved me in an extensive correspondence. In that article I unfortunately showed only its application to that particular structure, which was too large and too expensive for the wants of most beginners in floriculture, I have received numerous letters inquiring about the application of this principle to smaller and differently shaped houses. Finding it well nigh impossible to satisfactorily reply to these queries by letter, I will show in this article how other houses of different designs and of smaller dimensions may be heated on the same principle. Figure 1 shows three of the usual ridge and furrow houses, which are 60 feet long and 11 feet wide, each with a furnace room, or shed, at one end, which is 12×33 feet.

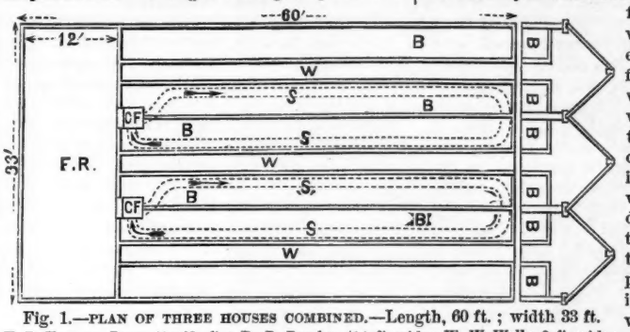


Fig. 1.—PLAN OF THREE HOUSES COMBINED.—Length, 60 ft.; width 33 ft.
F, R, Furnace Room, 12×32 ft.; B, B, Benches, 4½ ft. wide; W, W, Walks, 2 ft. wide; S, S, Smoke-flue for heating; F, C, Furnace, with Chimney built on top of it.

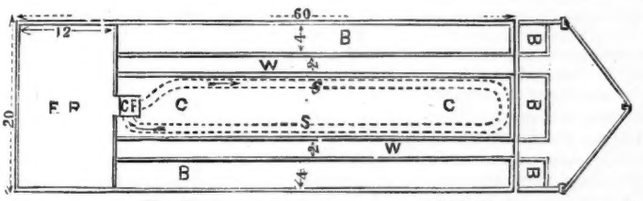


Fig. 2.—PLAN OF A SINGLE HOUSE—60×20 ft.
F, R, Furnace Room, 12×20 ft.; B, B, Side Benches, 4 ft. wide; C, C, Center Bench, 5 ft. wide; W, W, Walks, 2 ft. wide; S, S, Smoke-flue; C, F, Furnace with Chimney above.

Of course the length may be increased or diminished as desired, but this width is found to be the most convenient. It will be seen that the three greenhouses are heated by *two* furnaces, the flue being so disposed under the center benches of the houses as not to cross any of the pathways. This gives, of course, two runs of the flue to the middle house, and only one run each to the outside houses. This would in coldest weather give a temperature of not less than 40° to the outside houses, and 60° or 65° to the middle house, which has the two runs of flues. This difference in temperature is indispensable in a general collection of plants, and the neglect of it is more than anything else the cause of failure where growers have but one greenhouse. It will be necessary to have the flues built as close to the walks as possible, so that the heat be evenly distributed in the two outside houses. Figure 2 shows a greenhouse 20 feet wide by 60 feet long, with furnace room, or shed, 12×20 feet. Here again the flues are so disposed as to avoid crossing the walks, being placed under the center bench, but as near as possible to the walk on each side, so that the heat may be evenly diffused throughout. If a difference in temperature is required in a house of this kind, it may be obtained by running a glass partition *across* the house, say at 25 feet from the furnace end, which will, of course, make that end the hottest. It will be seen that the principle set forth in my article of November, 1874, is carried out in both these plans, and it would be unsafe to attempt to heat greenhouses of these dimensions without conforming to it. Its peculiarity consists in running the flue, in each case, back to the furnace from which it starts and into the chimney, which is built on the top of the furnace. As soon as a fire is lighted in the furnace, the brick-work forming the arch gets heated, and at once starts an upward draft, which puts the smoke-flue into immediate action and maintains it; hence there is never any trouble about the draft as in ordinary flues having the chimney at the most distant point from the furnace. It will be seen that by this plan we not only get rid of the violent heat given out by the furnace, but at the same time it ensures a complete draft, so that the heated air from the furnace is so rapidly carried through the entire length of the flue, so that it is nearly as hot when it enters the chimney as when it left the furnace. This perfect draft also does away with all danger of the escape of gas from the flues into the greenhouse, which often happens when the draft is not active. Although no system of heating by smoke-flues is so satisfactory as by hot water, yet there are hundreds who have neither the means, nor inclination to go to the greater expense of hot-water heating, and to such this revived method is one that will, to a great extent, simplify and cheapen the erection of greenhouses. Many old established florists, who have had the old plan of flues in use, have changed them to the one here described, and with great satisfaction. The wonder is that such an important fact has been so long overlooked, for when at the time it was discovered, heating greenhouses by flues was almost the only method in use.

As some may desire to know the cost of structures like those above described, I would say that, at present prices in the vicinity of New York, the plan of figure 1 would cost, complete, about $8 per running foot, or about $600 for the whole building, 72 × 33. The house shown in figure 2 would cost about $7 per running foot, or about $500 for the 72×20. This price is only for plain substantial work, such as is put up by commercial florists. The side and end walls being made of wood in the usual way, with cedar or chestnut posts, (locust is more durable than either,) and double boarded, with a layer of tarred paper between.

THE HOUSEHOLD.

☞ *For other Household Items see "Basket" pages.*

Home Topics.

BY FAITH ROCHESTER.

Early Education.

I have just gathered a little bundle of reading matter to lend to a friend in another town; and, as she may be supposed to be especially interested in all that bears upon the subject of babies, I have placed side by side two books, neither of them new, which may serve well to complement each other—"Ginx's Baby" and "The Child." The former, a good satire, and treating of politico-social economy, cannot fail to deepen in the mind of a thoughtful reader a sense of the danger of neglecting the early education of future citizens. Though one cannot help smiling at the fine touches of the satirist, one is moved at the same time with horror and compassion over the condition of the lower strata of humanity. Perhaps London is worse than any American city, but we all need to be stirred to the depths of our hearts over the ignorance and misery and consequent wickedness of millions of our fellow creatures. If we turn from the strange fortunes of that typical character, "Ginx's Baby," to Madam Kriege's book, "The Child," we can see, at least by faith, what may be the destiny of the human race on earth, in future ages: for surely we shall at last learn—if not in your day and mine, in some generation not far distant—the necessity of giving human beings a careful education in

their earliest and most impressible years. A "careful education" does not mean a deal of molding and binding, and hacking and hewing of the young immortal, but it means at least a healthful and happy atmosphere for soul and body both, and simple nourishment suited to the needs of both soul and body, and freedom for natural exercise of all the developing faculties in a manner promotive of the private and public welfare.

For the best success in this business of educating the young, associated effort is certainly necessary. "All are needed by each one." Young parents with only one child can hardly appreciate this fact. They mean to do their duty by their child, and they love it so dearly that they imagine themselves ready and able to supply all its needs. Family influences are strong, but they are by no means all-powerful. Few fathers and mothers exert an entirely wholesome influence upon their children, and there are besides neighbors and schoolmates of every variety of character. Our children have to be educated for life in the world as they find it, and so contact with society is as necessary as it is natural. For children, is needed a society of their equals, or the companions of school and the playground, and these exert an influence upon our children's habits, opinions, and aspirations, too strong to be disregarded in our account of educational influences. So, for very love of those descendants whom we call "our own," if for no broader or more humane reason, we must labor for the general education or for the establishment of free schools adapted to every age. At present you and I may not be able to find public primary schools where we dare to place our tender little ones; the public schools are sometimes too crowded, too low in their social tone, and badly managed in sanitary regards, as well as deficient in wise intellectual culture and wholesome moral stimulus.

But no parent can afford to withhold sympathy from the public schools. When the kindergarten is at last a part of the public school system, all over the country, we shall have taken a long step toward "peace on earth and good will among men." It is a great thing to accomplish, but it will cost far less than our present reformatories, and prisons, and various police arrangements for preventing and punishing crime. All the effort used to establish good schools for children of all ages and conditions tends to make less and less expenditure necessary for restraining and reforming bad men and women.

MISS BAILEY'S PAPER CUTTING.

Reforming old sinners is a slow and difficult task—we must lay the ax at the root of the tree of evil, and work earnestly to train up the young—all of them, rich and poor, Jew and Gentile—in the way they should go. If you and I cannot do anything in particular to push forward the kindergarten movement, we can serve the cause by waiting patiently for it, ready to take hold of the good work whenever it comes our turn, doing our own work meanwhile with the little ones around us as best we can, in the absence of the various helps and facilities which we know to be most desirable.

Home Tailoring.

If every wife would make her husband's coats, vests, and trousers, what a nice sum she might earn him each year! But then, why ought she any more than he should make her shoes and bonnets?

No, my brethren, not one of you must expect that, as a matter of course, your wife will always make even your shirts, and you surely must not expect that a woman, who has never served an apprenticeship as tailoress, will make you stylish outer garments. In a spasm of economy I decided that, considering our circumstances, including the fact of my possession of a sewing machine, it was my duty to learn to make the "everdy" clothing of my husband. He brought home an unmade coat and trousers cut by a good tailor. By studying his best tailor-made suit I was able to get the trousers together properly, but I gave up the coat in despair, first spending some precious hours in the study of a coat which I thought to use as a model. I at length gave it up, and the coat went to a tailor to be made up. I had thought to line it, and make it for a winter coat, but since I have ripped up an old coat, and discovered the wadding, and stiffening, and stuffing used in its manufacture, I am glad I did not persevere and spoil the garment. A tailor would have charged nine or ten dollars to have made the coat as I intended. It was finally made for spring without a lining, and, simple as the modest sack appeared in its construction, four dollars were paid for stitching those seams, hemming the bottom, and making three or four button-holes. I doubt whether the cloth cost more. I think I *could* make such an unlined sack-coat as that now, having practiced on boys' clothing with Butterick's patterns, but if a tailor thinks the job worth four dollars when the garment is all cut, I need not feel ashamed if I cannot rival him when I have served no apprenticeship. There is a knack about the pockets and the collars which the uninitiated can hardly expect to attain. In making our own frocks we often leave the pocket till the last thing, but pockets are of the first importance in a man's equipment, and you must get the pockets all right the very first thing. But one thing I can do, which I consider a valuable accomplishment in present circumstances. I can take a well-worn pair of grown-up trousers and make them over for a boy of ten, with very little labor, and so that they will do considerable service for home or school wear. Rip them apart and rip open the inside seam of each leg. Then lay your patterns upon each leg close to the unripped seam. At the top, you can cut them so as to retain the pockets and band, while cutting away the worn fronts. If the back has worn thin, the patches set in come so low down on the new and smaller pair, as to attract little notice. The knees are probably the worst part, and it is the easiest way to amputate the leg at the top of the worn portion, and, cutting it off again just below the bad place, sew the top and bottom together, matching the seam, of course. Possibly the same straps and buckle may be used behind without altering their former position.

Children's Teeth.

I have been looking at my little girl's teeth, and neither she nor I can tell exactly which ones belonged to the first and which to the second set. This leads me to regret that I have not kept memoranda of all such matters pertaining to my children's development. I have seen a book advertised, especially designed for this purpose, and I think young mothers would do well to provide themselves with one on the first appearance of "a babe in the house." It should be kept private, and every important physical change noted, with its date. Facts of this kind are sometimes of great service to the family physician, when called upon to prescribe for a member of the family. Parents often try vainly to remember just when some accident happened, or some childish sickness, which proves to have far-reaching and unforeseen results. It is interesting to observe the dental changes of a child. The coming of each little tooth in the first set is a great event in the family, but to the child itself, the process of second teething is deeply interesting. Here is a little girl by my side who feels more pride over a vacant place among the front teeth of her lower jaw than over any other feature of her face. She is sure now that she is growing up like other children, and she watches every day for the coming of her first "second tooth." Her

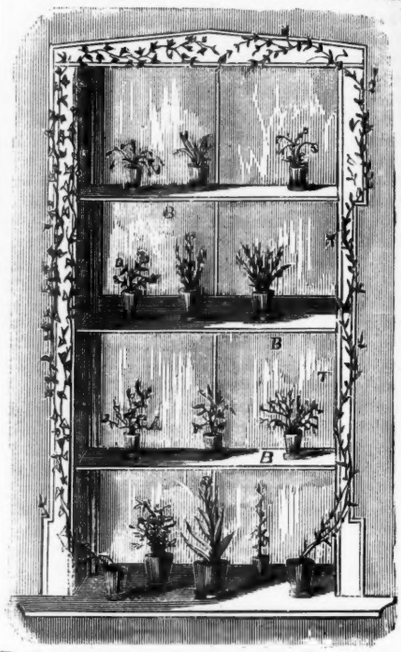


Fig. 1. WINDOW-SHELVES FOR PLANTS. *See next page.*

sister, who never had any difficulty at all about getting her first set of teeth, used to complain a year ago of great uneasiness in her jaws when the new double teeth were pressing through. You know, probably, that the first set of teeth has only eight double teeth, (or molars), and the child gets one more of these grinding teeth on each side of each jaw, or four new molars, when it gets its second teeth. The "wisdom teeth" come later in life, and sometimes with considerable pain. Some dentists and physicians think it a matter of great importance that children should have a plenty of bone-forming food all through the growing years, and investigation has convinced them that children fed on a plain diet, consisting largely of milk, oatmeal or graham, with lean beef, (if any meat), and vegetables and fruit, and little or no cake and sweet-meats, have better teeth—less trouble with the teeth every way—than children who eat considerable molasses, sugar, cake, and candy.

I saw a good dentist removing tartar from a lady's teeth after having filled several cavities. He used simple pumice-stone, which he said was the basis of many tooth powders. This he applied with a small pine stick, so scouring the teeth. Afterwards I treated the teeth of two little girls in the same manner. Their teeth had been neglected until they had a dark yellowish border next the gums. Simple washing with a tooth-brush would not remove this, but after one scouring with the pumice-stone, they were easily kept clean by the daily use of a tooth-brush. Well kept teeth do not need "scouring," and powders of all kinds should be cautiously used. Children should be taught to take care of their teeth, to keep them clean, and to avoid all abuse of these useful members.

Art with Scissors.

As we were leaving the Women's Pavilion at the Centennial Exhibition, one evening, a lady, prominent in horticultural matters in the West, met us, and insisted that we should go back to see some beautiful flower work, cut out by a lady from paper. Not having much admiration for paper flowers, we turned back with some reluctance, and were introduced to a lady who, with scissors, was "evolv-

ing" from a strip of white paper, the most graceful flower and leaf forms. The lady presented us with a specimen of her work, mounted upon a square of black paper, upon the back of which was her card, "Harriet F. Bailey, of Walworth, Wis., 3601 Ludlow St., W. Phila. Pa." Miss Bailey's work shows an evident desire to follow nature, and being made from memory only, without drawing or any pattern to copy, it is placed far above anything like paper flowers, and similar productions. There is great ease of outline, and a grace in grouping and execution, that makes them very pleasing. To show what her cuttings are like, we give an engraving of a small cluster of the actual size. It will be seen that it is quite unlike those paper cuttings made by doubling the paper, once or several times; in those there is a reproduction of forms, and one side is the counterpart of the other. As the sculptor, who said that the statue was already in the block, and his business was merely to chisel away the superfluous marble, so Miss B. sees flower and leaf forms on the blank sheet, and she, only with fine scissors, liberates them from their imprisonment in the paper. We inquired of the lady how she came to take up this art, and learned that when a child, she and her sister occupied themselves in cutting, without any teaching; if they wished to describe anything to one another, or to their mother, they would take paper and scissors, and cut out the form of fruit, flower, or whatever object they wished to indicate, the scissors serving in their hands the place of pen or pencil. We found the artist with more orders on hand than she could fill, from those who wished to take away some graceful little remembrancer of the Women's Department of the Exhibition. We learn that Miss Bailey will have a desk at the permanent exhibition, which is soon to open in the Main Building. Children are very fond of cutting paper, and Froebel knowing this introduced paper-cutting among his Kindergarten occupations; though his is a mechanical kind of cutting, with folded paper. If children wish to cut paper, they should be encouraged to copy forms, and with an object in view, thus educating the hand and the eye, but it is only where there is a strong love for the objects represented, and an unusual natural talent to reproduce with the hand what is seen by the eye, that any can hope to attain to the skill shown in the work here noticed.

Plant-shelves in Windows.

BY L. D. SNOOK, YATES CO., N. Y.

Those who keep window-plants, will find that the following plan for attaching shelves to the windows will be useful in many cases, though of course its applicability will depend much upon the manner in which the house is built. The movable strip, or "stop," which holds the sash in place, is taken out, and in its place is put one an inch thick, and four or five inches wide, or as wide as the window will allow, as shown in fig. 1 by *B, B*. There are of course two of these, and in each is a series of grooves or "gains," as the carpenters say, intended to admit the ends of the shelves. To make this plain, an enlarged portion is shown in figure 2. By rounding the corners of the shelves, those for the larger pots may be six or seven inches wide, while the side strip which supports them is only

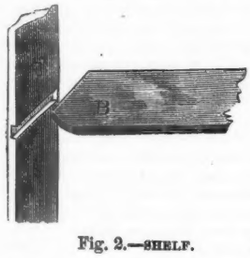


Fig. 2.—SHELF.

Fig. 3.—BRACKET.

four inches wide. Figure 1 shows a window thus furnished. When the shelves are no longer required, the side-pieces may be taken out and the "stops" returned, and no part of the window-frame will have been marred or injured in any way. Where it is not practicable to remove the "stops" and substitute side-pieces, then the shelves may be supported on brackets, of the form shown in figure 3. Any blacksmith can make these of a piece of nail-rod; they should be furnished with holes for screws, by which they can be attached to the window-frames, and there should also be a hole at *P*, through which to pass a screw from below into the bottom of the shelf, to hold it firm.—[We may add that Mr. S.'s suggestion of brackets will answer to support a window-box, which is by many window gardeners preferred to pots. Any rough box, of a length to suit the window, and about six inches high and wide, will answer. Have the tinman make a zinc lining to fit, and high enough to turn over the edge of the box, so that no earth may get between the box and the lining. The outside of the box may be covered to suit the fancy; strips of bark, or split twigs, will give a pleasing rustic effect, or it may be covered with a bit of floor oil-cloth with a molding on the edges. We once covered a box with oil-cloth of a mechanical pattern, and it had every appearance of an expensive tile-covered box. Recollect that a box of this kind is very heavy when filled, and the brackets and their fastenings must be correspondingly strong.]

COVER TO A PORK BARREL.—In families where pork is largely used, to cook or in cooking, the barrel, usually kept in the cellar, is frequently visited, the required slices of pork cut off, and the piece returned to the brine. It is a very simple matter, but very often there is no place at hand, clean enough, or suitable, whereon to place the piece of pork, while cutting. To supply this, our correspondent, Mr. L. D. Snook, suggests a cover to the barrel which will make the work cleanly and easy. Figure 1 shows the barrel when closed by its cover. The board, *A*, covers a part of the top of the barrel, being fastened by screws, and extends over to form a shelf, supported by the brace *E*. The remainder of the cover, *B*, is hinged to this stationary part. When the cover is opened, as in fig. 2, it rests upon the shelf, and affords a firm, clean, and convenient surface on which to do the cutting, and there is no trouble in looking about for a suitable place. These small things cost only a little time, and not much of that, but help make house work go on smoothly.

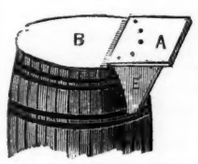


Fig. 1.—COVER CLOSED.

Fig. 2.—COVER OPEN.

PAINTING FLOORS.—"R. S. M.," Dodge Co., Nev., writes: "There is but one paint suitable for the purpose—*French Ochre*. First, if the boards have shrunk, clean out the joints well, and with a small brush give them a heavy coat of boiled linseed oil, then putty up solid. Now paint the whole floor with a mixture of much oil and little ochre, for the first coat, then, after it is well dried, give two more coats of much ochre and little oil, finally finish with a coat of first rate copal varnish. This is an extremely durable paint for floors, in-doors or out, such as verandas, porticoes, and the like. A floor stain is best mixed with *oil*, and finally varnished.

BOYS & GIRLS' COLUMNS.

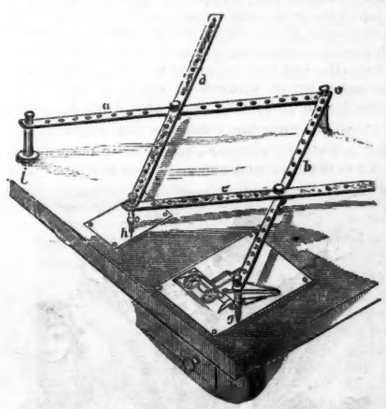
No. 458.—**Puzzle Picture.**—The artist calls this picture a view of the "Enchanted Bluff." There must be some charm to attract the animals there. It may be that they only got up there by "enchantment." It may be that he calls it enchanted for some other reason, and it may be that you can find out what it is.

A Drawing Machine.

Master A. J. H., writes to The Doctor that he saw at the Centennial Exhibition a machine used to copy drawings, called a "Smithograph," he sends a circular describing it, and wishes to know if he has a right to make one. The circular speaks of the "great, new, and beautiful art of Smithography," and much besides. Now I do not know anything about this "Smithograph," but I can tell my young friend something

ABOUT THE PANTOGRAPH,

which, whatever else it may be, is not "new." I saw it when I was a youngster, and of course it can not be so *very* recent. In fact, it is nearly 300 years since the thing was invented, and the novelty has worn off by this time. I find an engraving of it in that new and excellent book, Knight's "Mechanical Dictionary," which I give here.



PANTOGRAPH OR DRAWING MACHINE.

It is made of four rules, which my be of brass or of some hard wood. Two of these, *a* and *b*, are jointed at *c*; the other two, *d* and *e*, are jointed together over *h*. At *f* is a fixed point, screwed to the table, to which the rule, *a*, is so fastened that it can move easily. At *g* is a point for a tracer; at *h* is a pencil. When the point, *g*, is moved, the point or pencil at *h* follows its movements exactly. The joints, *c* and *h*, should work freely, but be true; these are not to be altered. The upper pair of rules, *d, e*, are fastened to the other pair, *a, b*, at any desired point; according to their position, the drawing traced by the point *g*, will be repeated by *h*, either larger or smaller. The drawing to be copied, is fastened by pins at *g*, and a piece of paper placed under the pencil at *h*; by carefully following the lines of the drawing with *g*, it will be repeated at *h*, the same size, or smaller, according to the point where the upper pair of rules are attached to the lower. To have the Pantograph work nicely, it must be well made, all the joints move easily, yet closely; it requires a little care to get the "hang" of it. At *c* there should be a leg or prop, to hold up the corner, and this should be smooth on the end to move on the board easily. The Pantograph—the name from the Greek for *all* and *to write*—will allow one to copy maps, plans, and such things very accurately, and to reduce them. I am afraid that not many boys are sufficiently skilled in the use of tools to make one themselves—but they can *try*.

How the Boy's Eyes "Sparkled."

A Father writes Dec. 30. "....It would have done the Publishers good to have seen our Jamie come rushing in from the P. O., all out of breath, to-day, and how his eyes did sparkle as he opened part after part of his 'Multum in Parvo Knife,' which came to him as a Premium for the club of subscribers he sent for the *American Agriculturist!* He is the happiest boy alive; I would not have him without the knife, if I had to pay for *all* the subscribers he sent. I am going to *help* another of my boys get a list to send you, to obtain a Bracket Saw, and a Pocket Tool-holder. People complain of 'hard times,' but I really believe that the *American Agriculturist* will *help* them in the hard times, and that we shall do every one a favor whom we persuade to take and read the paper...."—That is only one of a great number of happy households, made so by the arrival of premiums from this office—the Tool Holder, the Microscopes, the Bracket Saws, the Pocket Knives, the Crandall's Blocks, the Gold Pens, the Big Dictionary, the Melodeons, etc., etc. It will do the boys good to exercise their business tact, and their persuasive powers in gathering lists of subscribers, and it will do the subscribers obtained good also. Let all the boys and girls keep at this work all winter. The Premium List, which every one can get free by sending here for it, pictures and describes many good premium articles for the little people, and older ones too.

Fun for a Winter's Evening.

The article in December, showing some ways for amusing a holiday party—which are as good at any other time—have caused some parents to ask for more. One asks for some simple tricks in which all of a party of young folks can join, and which will not need so much fixing beforehand, as the "giantess" and others. There is one, quite old, but no doubt will be new to many new readers, which will afford some amusement. It is

GUESSING AT A HAT.

Pin a newspaper or other paper to a door or the wall, close down to the floor. Let the oldest boy put on a stiff or "stove-pipe" hat, or ask the father or older brother to wear it. Now let each one, in turn, mark with a pencil on the paper what he thinks is the hight of the hat. That is, if the hat were set upon the ground, mark where the top of the crown would reach upon the paper. The fun consists in placing the hat down—after all have made their guesses—and seeing how near, or more likely how far from, the real size the marks will be....Here is another quiet bit of amusement, which is really very astonishing to those who never have tried it. It is

TO SEE THROUGH A HOLE IN THE HAND.

Roll up a piece of paper or a pamphlet to make a tube about 9 to 12 inches long, and an inch or so across. Put this tube to your right eye, and look through it at some object, attentively, keeping both eyes open. Now hold up your left hand with its back toward you, and bring it near the lower end of the tube, looking at your hand with the left eye, while the right eye is fixed on something through the tube. If you hit the right position, which you can soon do, putting the edge of the hand against, *not over*, the lower end of the tube, you will be surprised to see a hole in your hand through which you can see very clearly the things beyond. It is a very easy but most surprising little experiment, and will please old as well as young people. You will of course wish to know why this is so, why there seems to be a hole through the hand when there is none. The scientific journals are talking about this, but their explanation would hardly suit youngsters. We usually look at the same thing with two eyes, and the two images make one in our mind. Here we separate the two eyes in an unusual manner, and the mind brings together the circle made by the tube for one eye, and the hand seen by the other, and makes one of them. You can use a card or a book instead of the hand, and see the hole in the same manner, but it is more surprising to look right through your own hand, as as if a clean hole had been cut through it. You can vary this in several ways. If, when looking through the hole in the hand, you stretch out your left thumb, so that it will be seen by the right eye through the tube, the thumb will appear to be directly across the hole in your hand. Instead of looking at the hand, use a card; make a black spot on the card as big as a half dime, and look at it as before; the black spot will appear to be floating in the center of the hole, with nothing to hold it there. Another variation is to make a round hole in the card of the size of the half dime; look at this hole with the left eye, so that the real hole will be within the imaginary hole; the hole will appear exceedingly bright, and surrounded by a ring of shadow.....Probably most of you have made shadows on the wall to please the baby; by holding the hands in the proper position between the lamp and the wall, very amusing shadows can be made. On the same principle you can make a very lively and

AMUSING SHADOW GAME,

or "Shadow Buff," as it is called, only instead of one being blinded, and trying to tell who those who are caught are, by feeling their dress, hair, etc., the one who is *it*, has both his eyes open, and tries to guess who is who by their shadows. If there is no plain piece of white wall for the shadows, then hang up a sheet; there should be but one lamp in the room, and this must stand where it will not get upset, and spoil the sport, and where it will throw the shadows of those who pass in front of it upon the sheet. The one who is to guess, is seated with his face to the sheet, and the rest go by one by one, and he tries to tell whose the shadows are. When one is guessed, he or she takes the seat, and the game goes on. The fun consists in trying to disguise the shadows, by holding the hands or arms, or parts of the dress in such a manner, as to make strange forms on the sheet. The engraving will show how this is done. Perhaps a better way is to hang the sheet over a doorway; the one who guesses being on one side in the dark, while the others pass between the lamp and the sheet on the other side.

PLAYING THE GAME OF SHADOW BUFF.

The Doctor's Correspondence.

S. L. Richards among other things wishes to know about

JEWELS IN A WATCH;

he asks what they are, and what is meant by a "full jeweled watch." Of course S. L. knows that there are several wheels in a watch. That each wheel has an axle through it, and the ends of these axles, called pivots, rest in holes or bearings, in the frame of the watch. The accuracy of the watch depends greatly upon having the parts move easily, and without friction; these pivots are constantly in motion, and every means is taken to have them move as easily as possible. A pivot of steel moving in a brass bearing, will have less friction than in a steel bearing; if it move in a bearing of diamond the friction will be very much less, indeed, as little as can be. Diamonds, rubies, sapphires, garnets, and other hard stones are used for the bearings of the pivots in watches, and are called "jewels." Diamonds are rarely used, as they are so difficult to work; in the finest watches the jewels are usually rubies, and in the cheap ones rock-crystal, and even glass may be found. Some of the jewels are not larger than a pin's head, yet all these little things have to be ground and shaped, and have holes drilled to receive the pivots. In some watches only the pivot of the balance-wheel is jewelled, others have two or more holes jewelled, and when every pivot runs on a jewel, the watch is said to be "full jeweled." My friend R. is right in supposing that I can tell him about another matter, but as it does not belong to the Boys and Girl's Columns, I shall have to do it at another time and elsewhere.

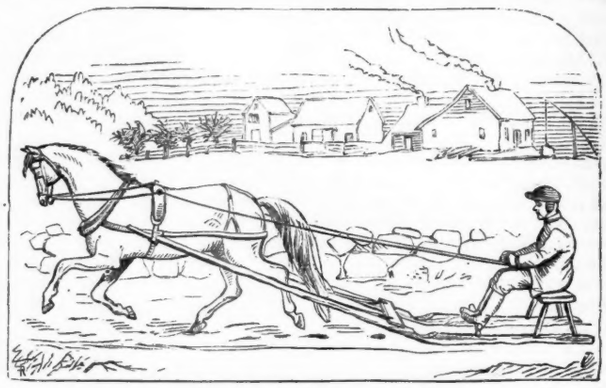


Fig. 1.—A JUMPER, MADE OF SAPLINGS.

....Master Johnston, in Northern New York, wishes to know how to build a hand-sled, and asks if he could not make one which his pony could draw. As to

BOY'S SLEDS,

there is an endless variety in these, some are regularly framed, runners and all, and have the runners shod with iron; these are much like a small sleigh, and are of course very expensive; the common ones are made with two pieces for runners, and a top. Snow does not often remain in the city long enough for boys to get much sledding, but when a snow does last a few days, I have seen boys with a sled made of a box, begged from the grocers.

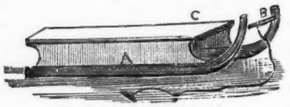


Fig. 2.—BOY'S SLED.

The bottom and two sides are all that are used; the bottom of the box serves for the top of the sled, while the sides are cut down and rounded at the ends, to make runners. Not very strong or handsome, you would think, but the little fellows seem to get as much fun out of these rude box-sleds, as richer boys do with the best. Some time ago our friend Mr. Snook, sent us a sketch, showing how a farmer's boy could make a good and serviceable sled; his drawing is given in figure 2. On almost every farm is a pile of odds and ends, in which are put broken implements, parts of carts and wagons, and other things too good to throw away or burn, and which are kept, thinking they may sometimes "come in play." If a boy can find in such a place an old plow of which he can use the handles, he has a first rate start towards building a sled. The plow handles are generally of hard wood, well seasoned, and smooth. Cut off the handles about two feet, or so, from the bend, turn them points up, and you will have a pair of capital runners, which will slide almost as well as if shod with iron. For the sides you will need two pieces of inch board, two feet long, or of a proper length to suit the runners. It will make the sled look much better if you shape out the ends of the side pieces, as shown in the engraving. Then you must fasten the sides firmly to the runners, and here you must be

careful. Whether you use nails or screws, the hard wood of the runners must be bored for them, and this will take both patience and strength. When the sides are on, you will then make the top, and for this you must nail on the boards cross-wise, to make the sled strong. The width may be according to fancy, or the use you are to make of it. If simply to "coast" or slide down hill, a long and narrow sled is best, but if you wish to carry loads, you will need it wider. You can put a round stick in between the upturned points of the runners, to hitch a drag-rope to, but in coasting this will be in the way, and you can as well hitch two ends of a rope to the points of the two runners. I don't think you can manage very well to make a pony sled and a hand-sled in one. For the pony, perhaps, the best thing would be what is called

A JUMPER.

As I don't know how old my young friend is, I am not able to say whether he can manage to make a jumper or not. Farmer's boys, generally, learn to use an ax when quite young, and if our youngster can work handily with an ax or hatchet, he can very likely make a jumper. However, I will tell him about the jumper, and if he can not make it by himself, he can get some older person to help. By giving an engraving, fig. 1, you will at once see how it is made, and it will save much description. Two saplings of the same size serve for runners and shafts, and make up the principal part of the jumper. These should be of hard wood, if wanted to last. Having the young trees, both of the same size and length, care should be taken to smooth off all the knots, if there are any, and if you wish to be very nice, you can peel at least the runner part. As the shafts must be high enough to hitch to the harness, while the runners are flat upon the snow, they must be bent. This is done by cutting half way or more through each stick, and you can easily contrive a way to bend it. You will then need to fasten your sticks together at a proper distance to suit the pony. A piece nailed or pinned on in front of the bend, answers both to strengthen the jumper, and as a place to which to fasten the traces. Take care to have this strong, as much of the strain comes here. You can then put on another cross piece, as a foot rest, and make the seat serve to strengthen it still more, as it will, if made as shown in the engraving. You may, if you prefer, floor the whole over with boards, and use another kind of seat. Jumpers are so common over the border, where there is usually snow in plenty, that they are often called "Canada Jumpers," but they are also used a great deal in the States. A man can knock one together in a very short time, and there is no reason why a handy boy can not manage to make one. I hope my young friend will succeed in making a useful jumper, that it will be strong to avoid accidents, and that he will have many pleasant rides with his pony.

Aunt Sue's Chats.

BETTINE.—The following formula will, I think, answer your requirements:

A	B	D	H	P
C	C	E	I	Q
E	F	F	J	R
G	G	G	K	S
I	J	L	L	T
K	K	M	M	U
M	N	N	N	V
O	O	O	O	W
G	R	T	X	X
S	S	U	Y	Y
U	V	V	Z	Z
W	W	W		
Y	Z			

Should a person wish you to find out a word or name, let him tell you in which of the upright columns the first letter of the word may be found; if it can be found in only one column, then it is the top letter; should it be found in more than one, then add together the alphabetical numbers represented by the top letters, and the sum will be the number sought. By taking one letter at a time in this way, the whole word can be discovered. For example: Take the word Darling; D is found in but one column, consequently is the top one. The same with A; R is in the second and last columns; the top letters of those are B, and P; these are the second and sixteenth of the alphabet, their sum is eighteen, and the eighteenth letter of the alphabet is R, the letter sought; L you will find in the columns headed D, and H, whose sum is twelve, and L is the twelfth letter of the alphabet. In this way, letter by letter, you can find out any given word.

For Chocolate Icing for Cakes--take half a pound of powdered loaf-sugar and two ounces of grated chocolate; put them into a sauce-pan with about a gill of water, and stir it over the fire until the mixture assumes the consistence of thick cream; then spread it over your cakes, and set them in the oven for two or three minutes.

CARPENTER'S BOY.—Not a bit of "trouble," my boy, you may "ask questions" every month if you choose, and I will answer them to the best of my ability. You want to know the meaning of the terms "four-penny," "six-penny," "ten-penny," etc., as applied to nails. "Four-penny" means four pounds to the thousand nails, "six-penny" *six* pounds to the thousand, and so on. It is an old English term and meant, at first, "ten-*pound*" nails (the thousand being understood); but the old Englishmen clipped it to "ten-*pun*"; and from that to ten-*punny*; and so it degenerated, until "penny" was substituted for "*pound*." So, when you ask for four-penny nails, now-a-days, you want those, a thousand of which will weigh four pounds; but in these degenerate times, I question whether you will get as many as a thousand in that weight. When a thousand nails weigh less than one pound, they are called tacks, brads, etc., and are reckoned by ounces (to the thousand); so you will see "8-oz.", "10-oz.", "16-oz.", etc., on papers of tacks. That used to puzzle me (before I knew better)—how eight small tacks should make one ounce, and sixteen much larger ones should make an ounce too! So I asked--just as you did. I am never ashamed to say "I don't know," unless I have neglected an opportunity to find out.

Aunt Sue's Puzzle-Box.

RHYMES.

(*Example.*—1. Here the ink has been spilled ——
2. By the gun it was killed ——. *Blot, shot.*

1. O! see the bright morning ——
2. Her fair head adorning ——
3. Delf, china, and iron ——
4. Neither panther nor lion ——
5. More than one, less than three ——
6. Too choice 'tis, for me ——
7. In the stable I live ——
8. A great fright I give ——
9. You oft rise by me ——
10. In her dress, do you see! ——
11. Here the tiger lies down ——
12. Green, speckled with brown ——
13. How much must I pay ——
14. I venture to-day ——
15. In caution I'm seen ——
16. And I'm pretty lean ——

ALPHABETICAL ARITHMETIC.

```
R D H ) C T U I L N ( U B U C
        C B N
        -----
          R I I
          R D H
          -----
            I B L
            C B N
            -----
            U D T N
            B I N U
            -------
              U B U
```

PI.

Thymauni si het prelucia sitaccerichart fo tager dimns.

CHARADE.

My first needs no delight its nature to show,
My next is two-thirds of a dwelling,
My third is oft felt in the air, and we know
That destruction its pathway is telling.

To England pray go, if my whole you would meet,
And list to its musical lays,
For indeed you will find it a songster most sweet,
E'en poets have sung in its praise. H. W. OTIS.

NUMERICAL ENIGMA.

I am composed of 69 letters:

My 10, 40, 19, 3, 52, 44, 30, was the scene of a European battle, where an army of ninety thousand men, commanded by my 27, 53, 12, 56, 24, 61, 50,—25, 2, 19, 39, was defeated by an 9, 24, 66, 54, of thirty thousand.

My 22, 9, 14, 44, 58, 15, 13, 67, is the name of a famous battle, which decided the fate of my 38, 28, 20, 23, 49, 53, 37, 33, who died at my 7, 18,—43, 56, 11, 69, 38, 61.

My 47, 65, 66, 1, has been something sung just before going to battle.

My 60, 26, 46, 8, 16, 64, 27, 35, 5, 6, is a name dear to Americans.

My 17, 34, 45, 62, 57, 27, 19, 42, was a noted naval officer in the late war.

My 19, 21, 27, 68, 48, 59, 51, was a distinguished military officer in our late war.

My 4, 1, 29, 32, 36, 48, 55, 31, represent many of the United States.

My 20, 63, 45, 41, 31, is a famous city in Europe.

My whole is a prophecy of peace. M. O. COLCORD.

ANAGRAMS.

1. Oh! bad boy!
2. Surf free.
3. A scalp-den.
4. Rain came.
5. Sure leap.
6. I'm Kate's.
7. Scan any one.
8. Inform us.
9. Rough, hot fare.
10. Send rats in mud.

XANTHO.

POSITIVES AND COMPARATIVES.

1. A ton,—a servant. 2. A coin,—the middle. 3. A body of water,—to reflect. 4. An animal,—more novel. 5. A vehicle,--a butcher. 6. A boat,—to cleanse.

BESSIE.

CONCEALED SQUARE WORD.

Bring a wide apron with you; one a trifle long at each side. W. L. E., JR.

CROSS WORD.

My first is in cloud but not in sky,
My next is in swim but not in fly,
My third is in man but not in boy,
My fourth is in marble but not in toy,
My fifth is in work but not in play,
My sixth is in moment but not in day,
My seventh is in sound but not in tone,
And my whole is the name of a precious stone.

ALICE S. PAUL.

ANSWERS TO PUZZLES IN THE DECEMBER NUMBER.

NUMERICAL ENIGMA.—Thanatopsis.

CONCEALED CAPES.—1. Clear. 2. Henry. 3. May. 4. Land's end. 5. Good Hope. 6. Horn. 7. Fear.

CROSS WORD.—Madrid.

SQUARE WORD.	DOUBLE ACROSTIC.
A S P E R	H— al —L
S T A V E	O—ttaw—A
P A L E S	L- edge—R
E V E N T	L— ila —C
R E S T S	Y— out —H

ANAGRAMS.—1. Magazines. 2. Arrangements. 3. Gardening. 4. Companions. 5. Jealousy. 6. Barbarisms. 7. Numbering. 8. Opportunity. 9. Cultivators. 10. Refinement.

TRANSPOSITIONS.—1. Pets, pest, step. 2. Mate, tame, team, meat. 3. Arm, ram, mar. 4. Veal, lave, vale. 5. Abel, able, bale, beal. 6. Naps, span, pans. 7. Now, own, won.

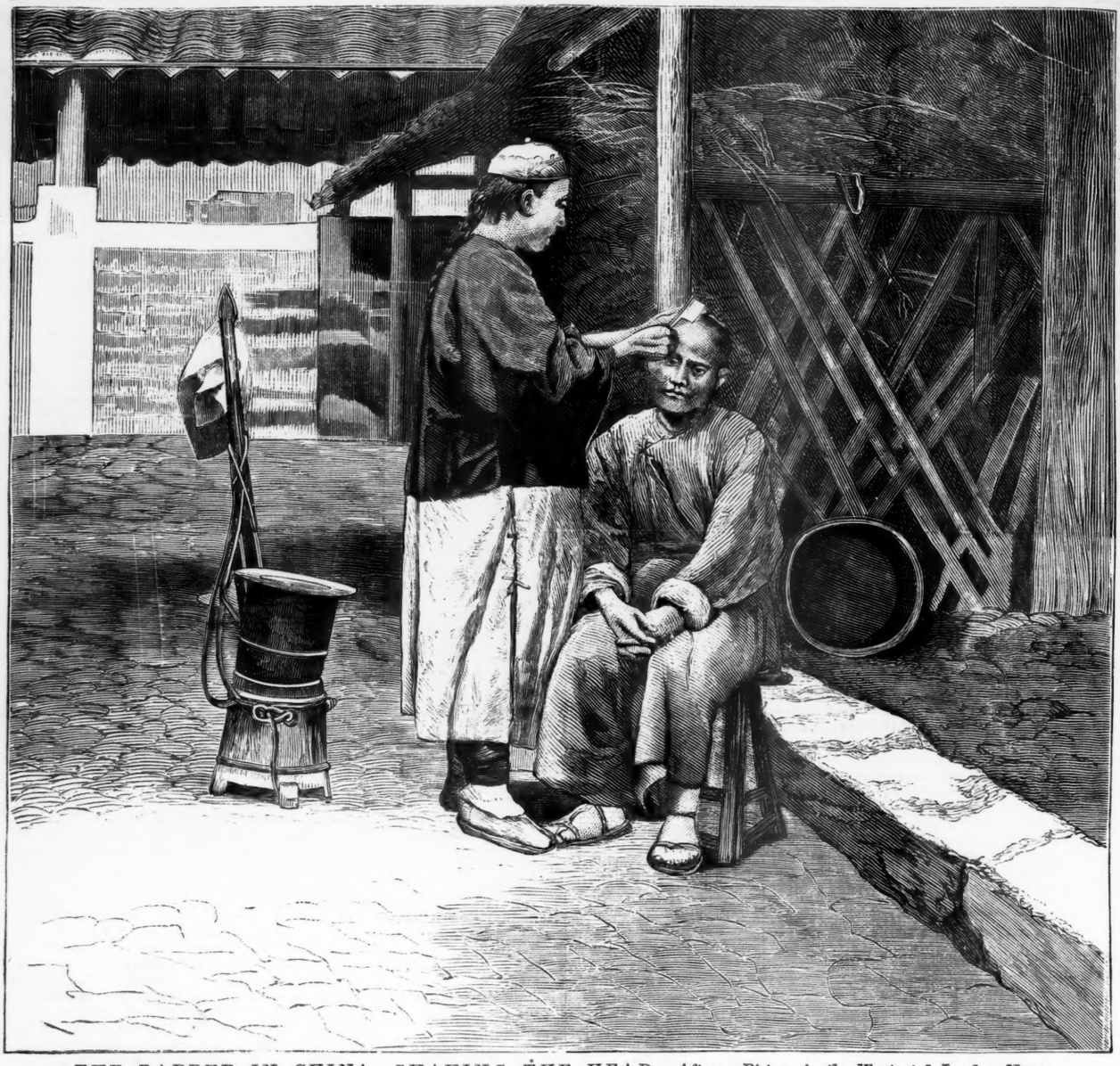
FLOWERS AND VEGETABLES.—1. Hollyhock. 2. Pumpkin. 3. Marigold. 4. Sunflower (son-flour). 5. Onion. 6. Corn. 7. Carrot (par*rot*). 8. Butter-cup.

PI.—What wondrous life is this I lead?
Ripe apples drop about my head,
The luscious clusters of the vine
Upon my mouth do crush their wine,
The nectarine and curious peach,
Into my hands themselves do reach.

Thanks for letters, puzzles, etc., to Dan. F. G., Sophie, J. F. D., Alpha and Bet, M. T. Hedd, Gus, Maggie, and Effie G.

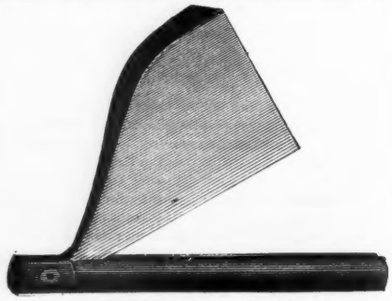
How Things are Done in Other Countries.—Dressing the Hair.

Quite a long jump, you will think, from bread-making to hair-dressing; but in telling you about common things in other countries, where their ways are different from our ways, we do not need to follow any regular order. It is a very curious fact, that there are scarcely any people, even the very lowest and least civilized, who do not do something to the hair of the head or face. There is much about hair, the manner of its growth, and the way it looks under the microscope, that is interesting, but we can not talk about these at present. Of course, the first use of hair is to protect the head, as well from heat, as from cold; another use is as an ornament; ornament has its uses, else there would not be such a variety in hair on both men and beasts. Animals covered with feathers instead of hair—the birds—are the most highly ornamented of all, and we are very sure that all the beautiful variety they display, is not without its uses. Compare a person with a fine head of hair, with one who is bald, and you will hardly doubt that hair is for looks, as well as for comfort. In ancient times the different nations and tribes had their fashions in hair, as do those of the present day. The ancient Greeks and Hebrews admired long hair, while the ancient Egyptians did not like it at all, but removed all the hair, and wore light wigs. Fine hair was thought so much of in olden times, that plucking out, or tearing the hair, was the way of showing the greatest possible grief. Among civilized people there have been curious customs. Some two hundred years ago a French king had a deformed shoulder, which he hid by means of an enormous wig, the bottom of which was so long as to cover his defect. Of course, this made wigs fashionable, and they were generally worn; they were often made of silk, and so large as to reach half way down the back. In early times, in this country, our great grandfathers, and their fathers, followed the ways of England, and the judges, governors, and all great dignitaries wore enormous horse-hair wigs. The war of the revolution put an end to all that here, though in England the custom is still kept up, and you will see in the illustrated English papers pictures of public occasions, in which judges, mayors, and all the rest have these ridiculous horse-hair head-coverings; even in the courts at the present time, in England and its Colonies, a lawyer puts on a black gown and a horse-hair wig, to address the judge, who sits gravely decked in what seems to us such senseless "toggery." It is no wonder that in London slang "big wigs" is the name for the dignitaries. With us short hair is the general rule for men, and long hair for women, but with many tribes of Indians the opposite is the custom; the men pride themselves on their long locks, while the women, as is often the case, cut their hair on a level with the eyes, and look droll enough. Speaking of the treatment of the hair by Indians, reminds us of a curious custom among the tribes of Arizona and New Mexico. When we first went among them, we found several of the men with the most singular head-dresses; a sort of turban on



THE BARBER IN CHINA, SHAVING THE HEAD.—*After a Picture in the Illustrated London News.*

top of the head, larger than the head itself, and this turban was of clay. On inquiring into the matter, we found that when the Indian finds his head too *populous* for comfort, for Indians are rarely free from insect parasites, (you must look that up in the dictionary)—he mixes up clay like mortar, and plasters his head as full as possible, winding it around on top of his head, and covering all with clay. This is worn for several days, or until the clay dries—and very uncomfortable and top-heavy it must be—when the clay is beaten and washed out; the hair then shines as if it were dressed by a city barber, while the inhabitants of the head "die for want of breath." Among the hair dressing customs of different nations, none are more peculiar than those of the Chinese, who shave all the head, except a tuft upon top; this is made to grow as long as it will, kept with great care, nicely braided, and as it is not often long enough naturally to please the taste of the owner, it is helped out by braiding in at the end a lot of long silk threads. This queue, or "pig-tail," as it is called by other people, is a matter of great pride to the Chinese, and the loss of it is dreaded almost as much as death. The proper shaving of the head is a matter of great importance with a Chinaman, and if one neglects this, he is looked upon by his neighbors as being in a bad way, and it is thought of so much consequence that he is reminded by the "authorities" that he must attend to his toilet. Of course, this is a kind of shaving that one can not well do himself, but must have done by another, and this makes the barber a very important man in China. As there are over three hundred millions of people in China, and every man and big boy must have his head regularly shaved, it will be seen that a large share of the people must be engaged in scraping the heads of the rest. You will think that barbers' shops must be very plenty, but the fact is that the barbers have no shops at all. Visitors to China tell us, that among the many strange things they notice, is the great number of traveling tradesmen, and the amount of business done in the street, or in going from house to house. The Chinese blacksmith, tinker, shoe-maker, and



A CHINESE RAZOR—2/3 real size.

many others besides the barber, have no tools or stock in trade but what they can carry with them, and their shop is wherever they may happen to be. The engraving shows a Chinese barber serving a customer. He has his furnace of coal, and his pail of hot water; one is hung at one end of a bamboo stick, which goes across his shoulders, and the other at the opposite end, to balance; his towels, and all the rest of his outfit, are carried in the same way. When he reaches a customer the barber sets down his furnace, puts on the water, and sticks the pole up by them, as you see in the picture, and goes to work. We might give our arithmetical youngsters a problem, something like this: "If there are 100,000,000 heads in China to be shaved twice a week, and each used an ounce of soap a month, how many millions of pounds of soap are used for head shaving in the Chinese empire in a year?" No doubt many of you could cypher it out very quickly, but as they don't use soap at all, you need not take the trouble! "No soap, how then can they shave?" you will ask. One of the uses of soap in shaving is to make the skin smooth, so that the razor will run easily, and not cut the skin, and for this the Chinese barber uses clay instead of soap. But what a razor!—you will think that there must be a mistake in the drawing. The razor is a very odd looking affair, quite as heavy as our razors, but different in shape. We have had one of these razors almost ever since we can recollect—probably brought home by an uncle who was captain of a ship that sailed to China. We never yet found a person who, upon being handed this razor closed, could guess what it was for. As the razor in the picture is of a different shape, we give an engraving of ours, that you may see what a droll affair it is. So you see, in looking about among different countries, even so simple a matter as shaving, is done by some people in a manner quite different from our own.

1877.

Postage Free.

NOW IS THE TIME TO SUBSCRIBE

TO

HARPER'S PERIODICALS.

The success of Harper's periodicals is among the remarkable facts of the publishing business of this or any other age or country.—*Christian Advocate*, N. Y.

Of these standard publications it is not necessary to say more than that each resumes in itself the history and progress of the time in a certain department; one containing the cream of current literature, a second preserving and illustrating all events of importance the world over, the third anticipating fickle fashion and chronicling its changes, and all commending themselves equally to the reader, no matter of what sex, age, or condition.—*N. Y. World.*

Harper's Magazine.

That *Harper's Magazine* has become a literary institution and an educator of the people a half million of readers know to-day.—*Boston Transcript.*

Harper's Weekly.

Harper's Weekly should be in every family throughout the land, as a purer, more interesting, higher-toned, better-illustrated paper is not published in this or any other country. —*Commercial Bulletin*, Boston.

Harper's Bazar.

The ladies best appreciate the merits of the *Bazar*, a weekly devoted entirely to their interests in all its various departments of literature, fashion, and domestic arts. It is an admirably conducted illustrated paper, containing essays, editorials, stories, and general information of a superior order.—*Brooklyn Eagle.*

TERMS FOR 1877.

HARPER'S MAGAZINE, One Year.....$4 00
HARPER'S WEEKLY, One Year.... .. 4 00
HARPER'S BAZAR, One Year..... 4 00

One copy of either will be sent for one year, POSTAGE PREPAID by the Publishers, to any Subscriber in the United States or Canada, on receipt of Four Dollars.

HARPER'S MAGAZINE, HARPER'S WEEKLY, and HARPER'S BAZAR, for one year, $10 00; or any two for $7 00; *postage prepaid by the Publishers.*

An Extra Copy of either the MAGAZINE, WEEKLY, *or* BAZAR *will be sent gratis for every Club of* FIVE SUBSCRIBERS *at $4 00 each, in one remittance; or, Six Copies for $20 00, without extra copy; postage prepaid by the Publishers.*

Address HARPER & BROTHERS, New York.

Subscriptions taken for Harper's Periodicals by Booksellers and Periodical Dealers throughout the United States and Canada.

BEST Poultry Journal 2 months, only 10 cents. Address Poultry Nation, Birmingham, Erie Co., O.

Herald of Health for 1877

and 4 back Nos. free $1.00. Samples 10 cents.

Eating for Strength, or how to feed ones self so as to maintain health, $1.00. Liver Complaint, Headache and Nervous Dyspepsia, their Cause, Prevention, and Cure, by Hygiene, $1.00. All the above, $2.50. Circulars free. See Dec. *Agriculturist.*

WOOD & HOLBROOK,
13 & 15 Laight St., New York.

A Good Home School.

MACGREGOR HALL,

FLUSHING, N. Y.

An Excellent HOME SCHOOL for *Young Ladies* and Children, seven miles from N. Y. City, in the beautiful suburban village of Flushing.

Pupils received at any time when there is a vacancy, the number being limited to the ability to furnish convenient rooms and full *home attention* to each Pupil.

For circulars or other information, address the Principal,
Miss MARGARET MACGREGOR,
Flushing, N. Y.

FINE TEAS.

This is a combination of capitalists to supply the consumers of Teas throughout the United States on the mutual principle.

We expect every consumer of Teas to render us all the assistance they can in carrying out our enterprise, as we make a specialty of SUPPLYING CONSUMERS ONLY, (and allow no middlemen to make any profit on our importations,) which will enable us to supply them with Teas at prices lower than have ever been known, and of those fine qualities that seldom reach the interior, being sold only in large cities and among the very wealthy.

SEND FOR PRICE LIST.

CONSUMERS' IMPORTING TEA CO.,
No. 8 Church Street,
P. O. Box 5509. NEW YORK CITY.

THE
MUTUAL LIFE
INSURANCE COMPANY
OF NEW YORK.
F. S. WINSTON, PRESIDENT.
ISSUES EVERY APPROVED DESCRIPTION OF
LIFE AND ENDOWMENT POLICIES
ON TERMS AS FAVORABLE AS THOSE OF ANY OTHER COMPANY.
ORGANIZED APRIL 12TH 1842.
CASH ASSETS OVER $80,000,000.

FRANK FORESTER'S
AMERICAN GAME IN ITS SEASONS.

Illustrated with twenty beautiful full-page Engravings from Nature of American Game.

CONTENTS:—JANUARY. Caribou or American Reindeer. —FEBRUARY. Moose Deer. Wild Goose.—MARCH. Mallard and Widgeon.—APRIL. American Snipe. Striped Bass. — MAY. American Trout. Brent Goose. — JUNE. Bay Snipe. Godwit. Salmon. — JULY. Woodcocks.—AUGUST. Summer Duck. Common Deer.—SEPTEMBER. Teal.—OCTOBER. Quail. Bittern. —NOVEMBER. Ruffed Grouse. Yellow Perch.—DECEMBER. Canvas Back. Winter Duck. Fully Illustrated and Described. New edition. Post-paid, $3.00.

Gardening for Pleasure.

A GUIDE TO THE AMATEUR IN THE

Fruit, Vegetable, and Flower Garden,

WITH FULL DIRECTIONS FOR THE

Greenhouse, Conservatory, and WINDOW GARDEN.

BY PETER HENDERSON,

AUTHOR OF "GARDENING FOR PROFIT," AND "PRACTICAL FLORICULTURE."

ILLUSTRATED.

It is one of the best guides to window-gardening we know of. The fact is, that the number of plants that can be successfully grown in window-gardening is very limited, and though it is possible to make a very large list of those which may be grown, if unusual pains be taken, the general cultivator wishes only to undertake those which promise to be successful with a moderate expenditure of time and attention. The rules to be observed in order to succeed with window plants, are very few, and the whole story is plainly told.—*Christian Advocate*, Pittsburgh, Pa.

Price, Post-paid, $1.50.

Either of the above books sent post-paid on receipt of price by

ORANGE JUDD COMPANY,
245 BROADWAY, NEW YORK.

BROOM-CORN and BROOMS.

A TREATISE ON

Raising Broom-Corn and Making Brooms

On a Small or Large Scale.

Written and Compiled by the Editors of the American Agriculturist.

CONTENTS.

Introduction. Broom-Corn and its Varieties. Description of the Plant. Introduction and Extent of Culture. Secondary Products, Seed, Fodder and Stalks. Cultivation, The Land. Rotation. Manure. Hills or Drills. Quantity of Seed to the Acre. Time of Planting. Cultivating. Implements. Thinning. Time for Harvesting. Harvesting Dwarf Corn. Lopping, Bending or Breaking. Crooked Brush. Tabling. Cutting. Preparing for Market. Curing the Brush. Scraping or Removal of the Seed. Assorting the Brush. Drying or Curing House. Racks for Drying. Curing. Curing and Handling the Crop on the Large Scale. Baling. The Press. Marketing. Commissions and Charges. Profits of the Crop. General Conclusions. Growing on the Large Scale. What a Retired Grower says. Making Brooms. Home-Made Brooms. Home-Made Brooms, Another Method. Making Brooms by Machinery. Extent of the Manufacture.

PRICE, POST-PAID, Paper cover, 50 cts., cloth, 75 cts.

Practical Floriculture.

A Guide to the Successful Propagation and Cultivation of Florists' Plants.

By PETER HENDERSON,

Author of "Gardening for Profit."

Beautifully Illustrated. Price, Post-paid, $1.50.

In this work, which has everywhere become so deservedly popular, not only is the whole "art and mystery" of propagation explained, but the reader is taught how to plant and grow the plants after they have been propagated. The work is not one for florists and gardeners only, but the amateur's wants are constantly kept in mind, and we have a very complete treatise on the cultivation of flowers under glass, or in the open air, suited to those who grow flowers for pleasure as well as those who make them a matter of trade. The work is characterized by the same radical common sense that marked the author's "Gardening for Profit," and it holds a high place in the estimation of lovers of floriculture. The new edition has been thoroughly revised by the author, and much enlarged by the addition of valuable matter.

The following are a few of the subjects embraced in the latest edition:

Laying out Flower Garden and Lawn; Designs for Grounds and for Greenhouses; Soils for Potting; Cold Frames; Hot-Beds; Greenhouses Attached to Dwellings; Modes of Heating; Propagation of Plants by Seeds and by Cuttings; Culture of the Rose and Tuberose; Growing of Winter-flowering Plants; Construction of Bouquets, Baskets, etc.; Parlor and Window-Gardening: Wardian-Cases and Ferneries; Insects; What Flowers Grow in the Shade; Culture of Grape-Vines under Glass; The Profits of Floriculture; How to Become a Florist, etc., etc.

MANUAL ON THE
Culture of Small Fruits.

By E. P ROE,

Author of Play and Profit in My Garden, etc.

On the culture of Strawberries, Raspberries, Currants, Gooseberries, Blackberries, &c. Price, post-paid, 50 cts.

Either of the above books sent post-paid on receipt of price by

ORANGE JUDD CO., 245 Broadway, New York.

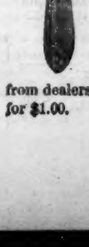
A COPPER BULL-RING,

2½ inches in diameter, of the most approved pattern, with screw-driver for putting it together, will be sent, prepaid, on receipt of $1.00. Address

ORANGE JUDD COMPANY,
245 BROADWAY, NEW YORK.

A Trochar for Cattle-Men.

In June of 1872 we gave illustrations of a Trochar and Cannula to be used in ringing a bull, and on page 13 (January) and page 97 (March) of this Journal for 1873 we described the use of this apparatus in relieving hoven in cattle. These articles have brought out a large demand for Trochars, and failing to find just the right kind among the makers of surgical implements, we have induced an establishment to undertake their manufacture. We give herewith a small engraving of the Trochar. These articles are now in the trade, and may be had of most dealers in agricultural implements. Those who can not get them from dealers can receive them from this office, prepaid, for $1.00.



Four Grand Prize Medals Awarded our Exhibit at the Centennial.

Rare and Beautiful Flowers and Choice Vegetables

CAN ALWAYS BE OBTAINED BY MAIL

BLISS'S SELECT GARDEN SEEDS

B. K. BLISS & SONS, Importers, Growers, and Dealers in Garden, Field, and Flower Seeds, Small Fruits, Agricultural and Horticultural Implements, Fertilizers, and Other Requisites for the Farm and Garden.

The following Catalogues are Annually published, and will be mailed to all Applicants on receipt of price affixed. Regular Customers supplied gratis.

Bliss's Illustrated Seed Catalogue and Amateur's Guide to the Flower and Kitchen Garden.—300 pages, including several hundred finely executed engravings, and a beautifully-colored lithograph, 25 cents. An edition elegantly bound in cloth, $1.

Bliss's Illustrated Gardener's Almanac and Abridged Catalogue.—128 pages. Embraces a Monthly Calendar of Operations, and a Price List of all the leading Garden, Field, and Flower Seeds, profusely illustrated, with brief directions for their culture. 10 cents.

Bliss's Illustrated Potato Catalogue contains a Descriptive List of all the new varieties recently introduced, with many other desirable sorts, beautifully illustrated; also most useful information upon the cultivation of this valuable esculent. 10 cents. Address

B. K. BLISS & SONS,
P. O. Box No. 5712. 34 Barclay St., New York.

The Earliest Tomato Known.

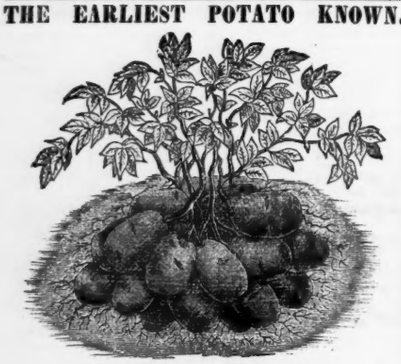
LITTLE GEM.

This new variety was raised by the originator of the Conqueror Tomato, heretofore considered the earliest in cultivation. The vines are of medium length, compact growth, and excessively loaded with bright red fruit of medium size, of round and uniform shape, varying from four to six inches in circumference, of superior flavor, either raw or cooked. Its bright glossy red color, uniform size, shape, and otherwise beautiful appearance, make a dish of LITTLE GEMS almost as tempting as a plate of strawberries. It may be relied upon to yield several pickings, a week or ten days earlier than any other variety.

Price, 25 cts per packet; five packets for $1.00.

B. K. BLISS & SONS,
34 Barclay St., New York.

THE EARLIEST POTATO KNOWN.



ALPHA. (Pringle.)

1707 pounds, (upwards of 10 barrels), grown from one pound.

A very early variety for farm and garden culture, also for forcing under glass; fit for the table ten or fifteen days before the Early Rose. Of medium size, clear white, with the slightest tinge of red about the eyes; flesh very white, fine-grained, dry, and of excellent flavor; quality, of the highest excellence. A first-class certificate was awarded by the Royal Horticultural Society, of London, in 1874. A silver medal was also awarded by the Massachusetts Horticultural Society. We can recommend this with the greatest confidence *as the very best early variety in cultivation.*

The report of the committee for awarding the premiums offered by us last spring, thus report of this variety: "The superior quality of the *Alpha* is largely commented upon. It was found to be fit for use in *sixty days* from the date of planting, and of excellent quality. That it will henceforth rank as the earliest Potato for the field as well as for the garden, has been sufficiently proven."

Per pound 75 cts., 3 lbs. to one address, $2.00 by mail, postpaid. By express, charges paid by purchaser, 1 peck $2.00; half bushel, $3.00; 1 bushel $5.00; 1 bbl. $12.00.

Bliss's Illustrated Potato Catalogue contains a descriptive list of all the new varieties, with many other desirable sorts; also most useful information upon their cultivation. 24 pages. **10 cents.** Address

B. K. BLISS & SONS, P. O. Box, 5,712,
No. 34 Barclay Street, New York.

New Potatoes.

We take pleasure in announcing **THREE NEW VARIETIES POTATOES** for the coming season, **Brownell's Centennial, Superior,** and **Improved Peach Blow.** Circulars giving a full description mailed free to applicants.

B. K. BLISS & SONS,
P. O. Box No. 5712, New York.

DREER'S GARDEN SEEDS. ALWAYS FRESH & RELIABLE.

1877 DREER'S GARDEN CALENDER, 1877

Contains descriptive and price list of Vegetable, Flower and Grass Seeds, Plants, Bulbs, Novelties, and every GARDEN REQUISITE. Beautifully illustrated. 180 pages. Send two 3 ct. stamps for postage.

HENRY A. DREER, 714 Chestnut St., Philadelphia.

The Greenbrook & Paterson City Nurseries'
Floral Calendar, Journal, and 3 Sample Plants, 25 cts.
Lists Free. J. GREIVES, Sec., Box 887, Paterson, N. J

ONLY THE BEST.

All who have a Garden should send for my Illustrated Catalogue, descriptive of the latest Novelties and choicest Varieties of Vegetable, Field, and Flower Seeds. Free to all on receipt of postage-stamp.

WM. H. CARSON,
SEEDSMAN,
125 Chambers St., N. Y.,
(Late of Peter Henderson & Co.)

Shakers' Garden Seeds.

True and Genuine. Fresh and Reliable.

One of the oldest seed firms in the country. Seeds sent by mail Postage free. Special prices and terms to *Grangers.*

"The excellence of the Shakers' Garden Seeds is generally admitted."—*Ed's Am. Agriculturist.*

Illustrated and descriptive Catalogue of Vegetable and Flower Seeds **Free.**

Address **CHARLES SIZER,**
Mount Lebanon, Col. Co., N. Y.

JOHN SAUL'S

Catalogue of New, Rare, and Beautiful Plants,

will be ready in Feb.—with a Colored plate of the **NEW STRIPED ROSE, Beauty of Glazenwood.** A Hybrid Tea, of a most distinct and novel kind. The ground tint is a lovely golden yellow, darker than, but after the style of, Madame Falcot, each petal being distinctly striped, and flaked with a bright carmine, as often seen in the coloration of some Tulips, the buds, before expanding, being boldly and beautifully marked with crimson. Delicately sweet. It is impossible to convey by description the marking and beauty of this charming Rose.

"*A Rose of golden-yellow, striped and flaked with scarlet or vermilion sounds like a dream or a fairy tale; it is, nevertheless, a reality.*"—H. CURTIS, *in* THE GARDEN.

Free to all my customers—to others price 10 cts.—a plain copy free. **Washington City, D. C.**

Greatest Inducement

EVER OFFERED TO

Lovers of Flowers.

Purchasers remitting $1.00 for Flower Seed in Pkts., we send Post-paid, choice of the following beautiful Chromos: **Group of Pinks and Moss Buds, Apple Blossoms,** or **May-flowers.** The above are sold at $1.00 each.

Those remitting $2.00 are entitled to choice of **Italian Landscape,** either Summer or Winter, or of **English Landscape,** Summer or Winter. The above are sold at $2.00 each.

Those remitting $3.00 are entitled to one picture each from the $1.00 and $2.00 premiums.

The above Chromos are from the well known house of L. Prang & Co. For further particulars and larger prizes, see our **Illustrated Catalogue** of 150 pages, which will be sent on receipt of two 3c. stamps.

The well known reputation of our seeds, for the past twenty years, will be a sufficient guarantee.

Address **WASHBURN & CO.,**
100 Tremont St., Boston, Mass.

Flower Seeds. Flower Seeds.

33 KINDS FOR $1.00.
BY MAIL, POSTAGE PREPAID.

A list comprising nearly 300 kinds of the most desirable flowers in general cultivation, from which as fine flowers can be obtained as if selecting from an expensive fancy catalogue, and at less than half the expense—will be sent to all who apply for it.

G. R. GARRETSON, Flushing, L. I., N. Y.
Wholesale and retail dealer in all kinds of seeds.

SEED CATALOGUES FREE.

All about growing **FLOWERS** and **VEGETABLES. BEST SEEDS** in the market; sure to grow; large packets; low prices; liberal discounts. Books and Papers as premiums. **CABBAGE** and **ONION SEED** a specialty. For 25 cts. we send a collection of 6 pkts. **Choice FLOWER SEEDS.**

Address **COLE & BROTHER,** Seedsmen, Pella, Iowa.

PURE CANE SEED.

VARIETIES.—LIBERIAN, REGULAR SORGO, NEREZANA, and OOMSEEANA. PRICES:—By Mail, postage paid, 50 cts. ℔ lb.; by Express, 25 lbs. or less, 50 cts. ℔ lb.; over 25 lbs. 20 cts. ℔ lb., package included. We recommend the Liberian for general cultivation. Two to three pounds required per acre. Money with order.

The Sorgo Hand-Book on the culture of Cane and making Syrup, with description of the Cook Evaporator and Victor Cane Mills, sent free.

Blymyer Manufacturing Co., Cincinnati, Ohio.

Market Gardeners

AND

FLORISTS,

Can obtain our Monthly

WHOLESALE LISTS

FREE ON APPLICATION.

Peter Henderson & Co.

Seedsmen, 35 Cortlandt St., New York.

For 25 Cents

I will send **MY PRICE LIST for 1877,** and one package each of **SUGAR TROUGH GOURD, PANSY, DOUBLE ZINNIA,** and **BLOTCHED & STRIPED PETUNIA.**

The **GOURDS** grow by the acre, to hold from 4 to 5 gallons each, and I exhibited one at the *Agriculturist* office that held **Eleven gallons.** They make the best of **Nest Boxes** for the Poultry House, and are valuable for many household purposes. We use them for Salt, Egg, and Soap Dishes, Measures, Lard Cans, etc., etc. The above cut shows the form.

Address **WALDO F. BROWN,**
Box 2, Oxford, Butler Co., Ohio.

J. M. THORBURN & CO'S SEED WAREHOUSE

15 JOHN ST., NEW-YORK.

NEW PRICED DESCRIPTIVE CATALOGUES
—OF—
Vegetable and Agricultural Seeds
ALSO
New Flower Seed Catalogue
FOR 1877. READY FOR MAILING.
FREE TO ALL APPLICANTS.

SEEDS. BULBS. SEEDS.

THE 100 DAYS TOMATO,

Introduced by the advertiser last year, sold to every State in the Union, tested by thousands, and proved to be by far

The Earliest Tomato,
The Most Prolific,
The Most Valuable to Gardeners.

Price per packet, 25 cents; Six for **$1.00.**

My Low Price-list of first-class Farm, Vegetable, and Flower Seeds, containing cut, description, testimonials, and culture of this Tomato, will be sent with every order.

Specialties—White Prov. Oats, German Millet, &c.

J. A. FOOTE, Seedsman,
Terre Haute, Ind.

MAILED FREE

FLORAL GUIDE

Contains over **1,200** varieties **Vegetable** and **Flower** Seeds, **COLORED PLATES.** Elegant wood-cuts of vegetables and flowers. **Handsomest Guide Published!** ☞ Send for it.

DETROIT SEED CO., Detroit, Mich.

GRATIS—A Fifty Page CATALOGUE,

Showing WHAT and HOW to PLANT; describing all the valuable new early and late PEACHES, and new long keeping Winter Apples, Pears, Quinces, Grapes, Small Fruits, Evergreens, Ornamental Trees, and Shrubbery. A large stock of all items usually found in a FIRST-CLASS NURSERY, all of which will be sold for less than half the usual retail price. Catalogue mailed gratis to all applicants. Apples and Peaches. Trees by mail. No charge for packing or postage. 75 varieties of apples to select from, including my popular list of long keepers. See Catalogue.

RANDOLPH PETERS,
Great Northern and Southern Nurseries,
WILMINGTON, DELAWARE.

SELECT SEEDS

ALL WHO WISH PURE AND RELIABLE SEED

at reasonable prices, should send for our **Illustrated Catalogue** for 1877, descriptive of all the NEW, NOVEL, and CHOICEST varieties of **Vegetable** and **Field Seeds.** Sent free to all applicants. HAWKINS & CORNISH,
Goshen, N. Y., (Successor to J. R. V. Hawkins.

YOU WILL MISS IT

if you don't get our Catalogue of **Choice Flower Seeds,** before buying seed. **We sell Flower Seed at precisely one-half the usual rates.** Agricultural Books and Papers as premiums to clubs, etc. Illustrated Catalogue for 1877 for stamp. **Burleigh & Bro.,** Plainfield, Conn.

DUTCHESS NURSERIES

Fruit and ornamental **Trees, Shrubs and Vines.** Greenhouse stock, and Vegetable, Field and Flower Seeds. Special Trade discounts. Send for Catalogues: No. 1 Seed—No. 2 Trade Seed List—No. 3 Nursery—No. 4 Nursery Trade List. Downing Gooseberry. 1 yr. old hardy **Roses.** Surplus Evergreens cheap. **Highland Hardy** Raspberry, most profitable red variety, 75c. doz. $2½ 100 post paid; $3 hund., $12 thous'd by express. **13** bedding plants, 8 kinds, $1, post paid. Star of the West Strawberry plants, 50c. doz., $2½ hund., post p'd. **W. L. FERRIS, JR., & CO.,** Poughkeepsie, N. Y.

Strawberry Plants

Thirty odd different kinds.

RASPBERRY PLANTS,

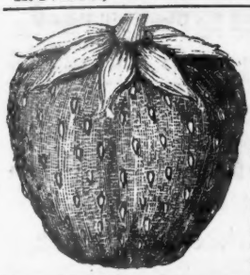
Fourteen different kinds.

CURRANT, GOOSEBERRY, BLACKBERRY PLANTS.—Choicest kinds for sale by

E. P. ROE,

Author of "Manual on the Culture of Small Fruits," "Play and Profit in My Garden," &c. Send for Circular. Address

E. P. ROE, Cornwall-on-the-Hudson, Orange Co., N. Y.



THE DUNCAN, the coming strawberry for market. Large, handsome, solid, productive, good quality, keeps and carries well, and is every way better than Wilson. Averaged 30c. per qt. wholesale *in N. Y. the past season.* Also, Great American, Cumb. Triumph, Monarch, Boyden's 30, &c. Best Raspberries, Currants, Grapes, Asparagus, &c. If you want only first-class Plants, send for Price List to E. & J. C. WILLIAMS, Montclair, N.J.

STRAWBERRY

PARMLEE'S CRESCENT SEEDLING

has more sterling qualities than any other berry yet offered to the public, producing over fourteen thousand quarts per acre, in field culture, if directions are followed. Send for circular. **H. H. SMITH, West Haven, Conn.**

NEW FRUITS.

19 New Peaches, 7 New Raspberries, 13 New Grapes, 25 New Strawberries.

NEW PLUMS, NEW APPLES, NEW PEARS, NEW BLACKBERRIES, &c.; together with all the Standard varieties, are offered at lowest prices in A. HANCE & SON'S Catalogue of Fruits for Spring of 1877. **Send for it!** Address **A. HANCE & SON,** Nurserymen and Florists, **Red Bank, N. J.**

Strawberry Plants, All the new, and best standard varieties. **Grape Vines,** Also Snowflake and Alpha Potatoes. Send for price list. D. E. HOXIE, NORTHAMPTON, MASS.

BRANDYWINE Raspberry, Wilson's Early Blackberry, Monarch and other Strawberries, Grape Vines, Osage Orange Hedge, Peach Trees, Apple, &c. Price list free. R. S. JOHNSTON, Stockley, Del.

SMALL FRUIT PLANTS a Specialty.

Reliable Stock at Lowest Prices. New List now ready. Send address to get one by return mail, and oblige JOHN S. COLLINS, Moorestown, New Jersey.

25 Cts. post-paid, the new white **ABUTILON,** (SOUVENIR DE NIEGE). **Verbenas,** $3.00, and **Coleus,** $6.00 per 100. Send stamp for cheap price list and catalogue. Address, W. B. WOODRUFF, Florist, Westfield, N. J.

Evergreen & European Larch Seedlings.

One of the largest and best stocks of Nursery-grown Seedlings in the U. S. Small sizes, suitable for nursery-row, screens, timber belts, ornament, and wind-breaks for sheltering buildings, gardens, farm crops, hot-beds, orchards, and live stock. Tree, Fruit, Shrub and Garden Seeds in variety. Send for Price Lists. Address H. M. THOMPSON & SON, St. Francis, Milwaukee Co., Wis.

LARGEST STOCK IN AMERICA OF

European Larch and Evergreen Trees.

Both Seedling and Transplanted. All grown from seeds on our own grounds, and better and cheaper than imported stock.

European Larch and Evergreen Tree Seeds,

By the ounce, pound or 100 pounds. Send for Catalogue.

ROBERT DOUGLAS & SONS, Waukegan, Ill.

DOUBLE TUBEROSE BULBS.

Superior Size and Quality.

	Doz.	100	1,000
First Quality Large Flowering Bulbs,	$ .75	$4.00	$30.00
Second Quality Flowering Bulbs,	.50	3.00	20.00
A few hundred EXTRA Large Bulbs,	1.00	5.00	
Dwarf Pearl, 1st quality Flowering Bulbs,	1.50	6.00	

If sent by Mail 25 cents per dozen EXTRA.

MILLER & HAYES,

5,774 Germantown Ave., Philadelphia.

CAMELLIAS, AZALEAS, ROSES, AND WINTER-BLOOMING PLANTS,

BY MAIL—POSTAGE PAID.

Send for Catalogue No. 6 with Supplement—contains two hundred and sixty-four collections of five, fifteen, and twenty plants each, your choice for one dollar. Address

ROBT. J. HALLIDAY, Baltimore, Md.

MARKET GARDENING.

Its General Management: Root Crops (a very full account of best methods); Market Crops for Small Farmers; The Home Kitchen Garden; Gardening Abbreviations (the whole in a nutshell); and much else on kindred topics in **Root's Garden Manual for 1877. Practical, pointed** and **thorough,** and contains half as much matter as $1.50 books on the subject. Sent for 10 cents, which will be allowed on the first order for seeds. Ready Dec. 1st.

J. B. ROOT, Seed Grower, Rockford, Ills.

A MANUAL

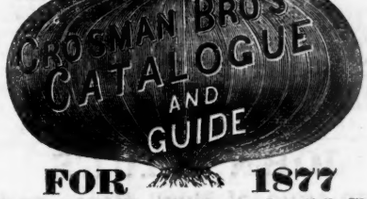
Of All Garden Requisites,

Seeds, Implements, Fertilizers, &c., For PRIVATE or MARKET GARDENS, FLORISTS and FARMERS.

FREE ON APPLICATION.

JAMES FLEMING,
67 Nassau St., New York.

SEND FOR



FOR 1877

To the Flower and Vegetable Garden. Beautifully Illustrated and containing a Magnificent COLORED PLATE. Will be mailed to any address on receipt of two 3-cent stamps. [*Established* 1840.] CROSSMAN BROS., Rochester, N. Y.

HOME GROWN SEEDS.

Messrs. Hovey & Co. invite attention to their very large and varied assortment of the best Home grown Farm, Garden, and Flower Seeds; embracing the very best strains for Farmers, Market Gardeners, Family Gardens, Amateurs, and Florists; also all novelties of merit introduced the past year. All who wish for first-class seeds at reasonable prices, are invited to send for catalogues, which will be ready in January, and sent free to customers and all who apply. Seeds sent by mail or express to all parts of the country.

HOVEY & CO., 53 North market St., Boston, Mass.

D. M. FERRY & CO'S NEW ILLUSTRATED DESCRIPTIVE AND PRICED SEED ANNUAL 1877

Will be mailed to all applicants on receipt of 25 cts. This is one of the largest CATALOGUES published; contains about 250 pages, over 600 fine engravings, 2 elegant colored plates, and gives full descriptions, prices and directions for planting over 1200 varieties of Vegetable and Flower Seeds, Bedding Plants, Roses, &c., and is invaluable to Farmer, Gardener & Florist. Address,

D. M. FERRY & CO., Detroit, Mich.

Our Abridged Priced Catalogue FREE to all Applicants.

THE FLOWER GARDEN

and kindred topics treated in a manner of interest to every lover of flowers, in **Root's Garden Manual** for 1877. Sent for 10 cents, which amount will be allowed on first order for seeds. Ready Dec. 1st.

J. B. ROOT, Seed Grower, Rockford, Ills.

THE NEW GOLDEN WAX BEAN

Is a great acquisition. It is very prolific, and of the choicest flavor; every family should have it. Package, 15c. Choice **VERBENA SEED,** per pkg.....15 cts.

BOTH THIS ABOVE.....25 cts.

I grew 1½ acres of **Choice Flowers** last year. Price List free. Read my advertisement on page 70 of this No. Address **Waldo F. Brown,** Box 2, Oxford, Butler Co., O.

200,000 PICKLES

per acre can be grown from the

GREEN PROLIFIC CUCUMBER SEED.

25 cents per ounce, by mail. Descriptive Catalogue of Small Fruits, Plants, Seeds, and Potatoes, free to all applicants. Address **F. M. HEXAMER.**

Newcastle, Westchester Co., N. Y.

VINEYARD FOR SALE.—With 8 or 900 Concord Vines, 3 years old. In good shape, with good trellis. A good new house with 4 rooms on the lot. Situated in a good market. For further information address P. O. Box 45, New Brighton, Pa.

SEEDS

Our Combined CATALOGUE for 1877 OF

EVERYTHING FOR THE

GARDEN

SEEDS PLANTS

Numbering 175 pages, with Colored Plate,

SENT FREE

To our customers of past years, and to all purchasers of our books, either Gardening for Profit, Practical Floriculture, or Gardening for Pleasure,

(Price $1.50 each, prepaid, by mail.)

To others, on receipt of 25c.

Plain Plant or Seed Catalogues, without plate, free to all.

Peter Henderson & Co.

Seedsmen, Market Gardeners and Florists,

35 Cortlandt St., New York.

PLANTS

VICK'S FLOWER AND VEGETABLE GARDEN

is the most beautiful work of the kind in the world. It contains nearly 150 pages, hundreds of fine illustrations, and *six Chromo Plates of Flowers,* beautifully drawn and colored from nature. Price 50 cents in paper covers; $1.00 in elegant cloth. Printed in German and English.

Vick's Floral Guide, Quarterly, 25 cents a year.

Vick's Catalogue—300 Illustrations, only 2 cents.

Address, **JAMES VICK,** Rochester, N. Y.

SEEDS

Having grown largely the past season, we are able to offer a large and superior stock of seeds at low prices. Special inducements to the trade and market gardeners. Catalogues sent free on application.

No. 1—*Retail Flower and Vegetable Seed Catalogue.*

No. 2—*Wholesale Seed Price-list* (for the *trade only*).

No. 3—*Retail Nursery and Greenhouse Catalogue.*

No. 4—*Wholesale Nursery and Greenhouse List.*

FERRIS & MINARD,
Poughkeepsie, N. Y.

My Annual Catalogue of Vegetable and Flower Seed for 1877 will be ready by January, and sent **free** to all who apply; Customers of last season need not write for it. I offer one of the largest collections of vegetable seed ever sent out by any seed-house in America, a large portion of which were grown on my six seed farms. **Printed directions for cultivation on every parcel.** All seed sold from my establishment warranted to be both fresh and true to name; so far that should it prove otherwise, I will refill the order gratis. As the original introducer of the Hubbard and Marblehead Squashes, the Marblehead Cabbages, and a score of other new vegetables, I invite the patronage of **all who are anxious to have their seed fresh, true, and of the very best strain. NEW VEGETABLES A SPECIALTY.**

JAMES J. H. GREGORY, Marblehead, Mass.

CATALOGUES MAILED FREE on APPLICATION.

Situation Wanted by a 1st class gardener. Long experience in Europe and America. The best of references given. Address ADOLPH LINKE, care of John B. Keller, Rochester, N. Y.

TREES

We offer for Spring of 1877, the largest and most complete stock in the U. S. of

Fruit Trees, Standard and Dwarf.
Ornamental Trees & Shrubs, deciduous & evergreen.
Roses a specialty—all the finest sorts.
Green & Hot House Plants, including best novelties.
Descriptive and Illustrated priced Catalogues sent prepaid to customers, **free,** to others, on receipt of stamps, as follows:

No. 1. Fruits, with colored plate, **15** cts., plain, **10** cts.
No. 2. Ornamental Trees, & col'd plate, **25**c., plain, **15**c.
No. 3. Greenhouse, **Free.** No. 4. Wholesale, **Free.**
No. 5. **List** of **New Roses, Free.**
☞ Small parcels forwarded by mail when desired.
Address

ELLWANGER & BARRY, Rochester, N. Y.

The New Peaches, Briggs' extra early May, Amsden's June, Alexander, Beatrice, etc., 250 sorts, the most complete collection in the world; the new strawberries, Great American, Capt. Jack, Duchess, Damask Beauty extra, Marshall McMahon extra, Kerr's Prolific, Monarch of the West, Montrose extra, New Dominion, Prouty's, Star of the West extra, Sterling extra, Transcendent, etc., 100 sorts, the finest collection in the U. S.—Fruit and ornamental trees, *small fruits,* shrubs, evergreens, roses, bulbs, flower and garden seeds. 25 packets of either garden, flower, herb, tree, evergeen or fruit seed, pre paid by mail, $1.00. 12 superb gladiolus, mail, $1.00. 12 superb Cannas, mail, $2.50. 12 splendid, new large-flowered hardy Clematis, different, named, mail, $4.00; 24 do. do., $8.00. 100 Norway Spruce, 1 foot, fine, mail, $5.64. In all sizes at low rates. 100 fine bedding plants, $10.00. Strong maples and oaks $2.50 per doz., $18 per 100. Fruit stocks and fruit seeds of all kinds. Priced descriptive catalogue No. 57, gratis. Trade List. B. M. WATSON, Old Colony Nurseries and Seed Warehouse, Plymouth, Mass. Established 1842.

SURPLUS STOCK for Spring of 1877.

50,000 1st class Peach trees, 4 to 6 feet, comprising the very best market sorts for the North and South. Also
50,000 2nd class trees, 3 to 4 ft.
20,000 Standard Pear, 2, 3 and 4 years.
10,000 Dwarf Pear, 2 and 3 years.
75,000 Concord Grape Vines, 1 and 2 years, fine.
10,000 Clinton " " " " "
The above stock is very desirable and worthy the attention of Planters, and will be sold very low.

FRANKLIN DAVIS & CO.,
Richmond Nurseries, Richmond, Va.

100,000 TREES.

All kinds; all sizes; at bottom prices; in closing ont our surplus this spring, Farmers, Fruit growers, and others, have a chance to fit up their surroundings cheap. Young stock by express any distance, little cost. 26 varieties new Russian apples, for the North. Wealthy apple, Souvenir du Congress, and other new Pears, Field Corn, 14 to 20 rows; yie.d this season 157 bush. ears of 35 lb. to acre. Pronties S.H. supersedes the Wilson. P. H. FOSTER, Babylon Nursery, N.Y.

PEACH TREES.—Handsome stock of best new and old sorts, with general assortment of hardy fruit and ornamental trees, flowering shrubs, vines, small fruits, &c. New price list free.

EDWIN ALLEN,
New Brunswick Nurseries, N. J.

Peach Trees, Small Fruit Plants, and **Vines.** Other Fruit and Ornamental Trees, and General Nursery Products, in large quantities at low rates. Satisfaction Guaranteed. For circular address CHAS. BLACK & BRO., Village Nurseries, Hightstown, N. J.

ALBANY SEEDLING, C. Downing, and Monarch of the West Strawberries, $2 per M. Wilson Early B. B., $12 per M. Apple Trees, 15c. each. Send for Price-list of trees and plants to

ST. C. DE COU, Moorestown, Burlington Co., N. J.

PRIME FRESH APPLE SEED, Crop of 1876, at $3 per bushel.

JAMES A. ROOT, Skaneateles, N. Y.

POMONA NURSERY, Millions of trees and plants. **Capt. Jack** and **Great American,** the best strawberries. Ten acres of *Brandywine* (Susquoco) raspberries, *yielded* in 1876, **$4,338.** Send for Catalogues.

WM. PARRY, Cinnaminson, N. J.

GRAPE VINES.

Also **Trees, Small Fruits, &c. Wholesale rates very low** to Nurserymen, Dealers, and large Planters. Send stamp for Descriptive List. Price List **free.**

T. S. HUBBARD, Fredonia, N. Y.

GRAPES

The **Largest Assortment** of **Old** and **New** Varieties. **Best Quality** of Plants. **Prices Greatly Reduced.** Correspondence solicited. Price lists free. Address

BUSH & SON & MEISSNER,
BUSHBERG, Jefferson Co., Mo.

Paper Seed Bags (all kinds) for Seedsmen and Florists. Samples sent free. CLARK BROTHERS, Paper Bag Manufacturers, Office, 15 New Church St., New York.

Reliable SEEDS

Our **CATALOGUE** of
SEEDS AND GARDEN REQUISITES
is now ready for mailing to all who enclose a stamp.

R. H. ALLEN & CO.,
P. O. Box 376. 189 & 191 Water St., N. Y.
Agricultural Implements and Fertilizers.

PRAY'S Greenhouses,

CENTRAL FALLS, R. I.
NEW CATALOGUE IN FEB'Y.
BEDDING PLANTS,
GERMAN SEED,
PANSIES, FINEST in U. S.
TUBEROSE BULBS. Full Double Large Flowering Bulbs,
10 Cents each; 12 for 80 Cents.

Will offer a fine selection of Roses, with Bedding Plants, Pansies, and Seed of our own selection from Germany in August and September.

We only ask a trial. Catalogue sent upon request. *No Stamps asked for.*

FINE STOCK — RELIABLE SEED

1877 Seed Catalogue, 1877

mailed free to all applicants. Correspondents, whose names are on our books, need not write for it. We offer for 1877 a very choice collection of **VEGETABLE, FIELD** and **FLOWER SEEDS,** all strictly

FRESH AND RELIABLE.

OUR VEGETABLE SEED LIST embraces the most desirable varieties. Our **FLOWER SEEDS** are all imported by us from the most celebrated French growers. **FIELD** and Grass Seeds—**6 Sample Packets** mailed free for two 3c. stamps.

Chester County Mammoth Seed Corn a specialty. We solicit the orders of amateurs, gardeners, and farmers, desiring seeds of superior excellence at fair prices. Send for a catalogue. Our catalogue also embraces choice lists of **TREES, PLANTS,** and **FLOWERS.**

BENSON & BURPEE,
Seed Warehouse, **223 Church St., Philadelphia, Pa.**

Strong Plants delivered *free of cost* safely per mail at your door. Satisfaction guaranteed. Splendid assortment of **ROSES**

FLOWERS

6 for $1; 13 for $2. Send for *New Catalogue of Plants.*

HOOPES, BRO. & THOMAS,
Cherry Hill Nurseries, West Chester, Pa.

THE DINGEE & CONARD CO'S
BEAUTIFUL EVER-BLOOMING

ROSES

Strong Pot Plants, suitable for immediate flowering, sent safely by mail, postpaid. **5 splendid varieties,** *your choice,* all labeled, for **$1; 12** for **$2; 19** for **$3; 26** for **$4; 35** for **$5.** For 10 cents each additional, one **Magnificent Premium Rose** to every dollar's worth ordered. Send for our **NEW GUIDE TO ROSE CULTURE,** and choose from over **300** finest sorts. We make Roses a **Great Specialty,** *and are the largest Rose-growers in America.* Refer to 100,000 customers in the United States and Canada. THE DINGEE & CONARD CO., ROSE-GROWERS, West Grove, Chester Co., Pa.

ROSES PER MAIL.

We offer 10,000 well rooted young Tea Roses, grown from our collection of over 100 varieties.

$1.50 per Doz. per Mail, $8.00 per 100 per Express.

Also, 10,000 one-year well established plants for immediate blooming, grown in 4 and 5 in. pots from our large collection of over 500 Varieties. (*Too heavy to send per mail.*)

Hy. Perp. and Noisettes, $3.00 per Doz. $20.00 per 100.
Teas and China, $2.50 per Doz. $18.00 per 100.

MILLER & HAYES, Mt. Airy, Philadelphia, Pa.
Catalogues of Plants & Roses sent for 3c. postage stamp.

ROSE GROWER'S COMPANION AND FLORAL GUIDE
Tells you how to grow Roses, Geraniums, etc. Mailing Plants a Specialty. Send for it. A. K. WILLIAMS, Successor to

ROSES E. Y. TEAS & CO., Richmond, Ind

ROSES

Fine ever-blooming and other **ROSES,** sent by mail postpaid everywhere, and their safe arrival guaranteed. 6 for **$1**; 14 for **$2**; 30 for **$4.** Purchaser's choice of nearly **600** varieties of **Roses** and other plants, carefully labeled. Fine Premium Rose with each package, when **10** cents are added. **Catalogue free.** Address

JOS. T. PHILLIPS & SON, West Grove, Chester Co., Pa.

ROSES FOR THE MILLION.

12 Choice Roses by mail for $1.
Descriptive Lists free.

TYRA MONTGOMERY, Mattoon, Ill.

CHAPMAN & VAN WYCK,

(Established 1849),
DEALERS IN
PERUVIAN GUANO
EXCLUSIVELY,
170 Front Street, New York.

Feed the Plant and the Plant will Feed You.

75 to 100 Bushels

CORN per ACRE

Produced by the

Stockbridge Manures,

and other crops in proportion. These manures are made by Formulas originated by Levi Stockbridge, a practical farmer and Professor of Agriculture in the Massachusetts Agricultural College. They have been extensively used for three years, and in 1876 were applied to over 4,000 acres with such success, that our best advertisement is to refer to farmers who used them. They are prepared for special crops, recognizing the fact that plants, like animals, differ, and require different food, or in different proportions, and must have it properly compounded to insure the best results.

PAMPHLETS containing full and valuable information, and experience of scores of farmers, **Sent Free.**

GREAT CROPS AT SMALL COST.

W. H. BOWKER & CO., (Sole Agents),
BOSTON,

Importers and Dealers in Reliable Fertilizers and High Grade Chemicals.

OUR PRINCIPLE: "We state what we sell and sell what we state."

Fish Guano.

Dry Ground Fish Guano, 8 to 10 per cent Ammonia; 15 per cent Bone Phosphate of Lime.
Half-Dry Fish Scrap, good quality. Also **Superphosphate** and **Pine Island Guano.**

PRICES LOW.

Address **QUINNIPIAC FERTILIZER CO.,**
180 State Street, NEW HAVEN, CONN.

Premium Pure, ODORLESS, Fine Ground RAW BONE, produces luxuriant grass. Sow now on land newly seeded. **Perfectly Inoffensive.** Very popular with Ladies and Gentlemen for house plants, **Lawns,** Gardens, and the Grapery. It never fails in producing grain crops. Send 20 cents for invaluable book, showing composition of cereal grains, and how to grow them. Address

EXCELSIOR FERTILIZER WORKS,
SALEM, OHIO.

Scribner's Lumber & Log-Book.

OVER HALF A MILLION SOLD. The most complete book of its kind ever published. Gives correct measurement of all kinds of lumber, logs and plank by Doyles Rule, cubical contents of square and round timber, stave and heading bolt tables, wages, rent, board, capacity of cisterns, cord-wood tables, interest, etc. Standard Book throughout the United States and Canada.

Ask your bookseller for it, or I will send one for 35 cents, post-paid.

G. W. FISHER,
P. O. Box 238, Rochester, N. Y.

---

65 of the prettiest Visiting Cards you ever saw, with your name neatly printed on them, sent by return mail, upon receipt of 25 cts. and a three-cent stamp. You will have samples of Glass, Marble, Snowflake, Damask, Repp, Tinted and White Bristol. The stock shall be first-class. I have some of the most particular and expert printers to be obtained in the country, and employ no inexperienced boys to turn off cheap work. No blurred or imperfect work leaves my establishment. Try them and you will be pleased. Write plainly, and give full address.

W. C. CANNON,
46 Kneeland St., Boston, Mass.

YOUR NAME neatly printed on 40 fine Bristol Cards (7 tints) for 10 cts. and 3c. stamp; on 50 Assorted Cards (no two alike) 30c. 20 Acquaintance cards, 12 styles, 10c. Agents' outfit, 25c.
CLINTON & CO., Box 49, CLINTONVILLE, CONN.

---

40 Finely Printed Visiting Cards (9 tints), with your name on them all for only 10 cts.
STAR PRINTING CO., Northford, Conn.

ZINC TAGS AND HORTICULTURAL INK
WARRANTED INDESTRUCTIBLE

For garden, hot house, and nursery purposes; marks a JET BLACK on prepared ZINC TAGS of four sizes. Use with a clean pen. Price 35 cents a bottle. Tags, 10, 15, 20, and 30 cents per doz. Liberal discount to dealers. Boxes containing 4 doz. tags, 1 doz. each size; a pen; one bottle of ink; 3 doz. plated wires, and emery paper. Price $1.00. *Tags may be had in any quantity.* Sold by all seedsmen and dealers in agricultural implements. These tags are more economical than the wooden ones; they will last for years, and used repeatedly by erasing with emery paper, thus preserving the name of each plant to maturity, and in transportation will prove its value. Climate, weather, or time has no effect on the writing.

GEO. RAPHAEL, Sole Agent for the U. S. and Canadas, New Rochelle, Westchester Co., N. Y.

AMERICAN AGRICULTURIST.

ORANGE JUDD COMPANY, Publishers, 245 Broadway, N. Y.

ANNUAL SUBSCRIPTION **Terms** (always in advance): $1.60 each for less than four copies: Four to nine copies, $1.35 each: Ten to nineteen copies, $1.30 each: Twenty copies and upward, $1.10 each. These rates *include Postage*, in each case, which is pre-paid *by the Publishers*. Papers are addressed to each name.

☞ Either English or German Edition, at these prices.

GREAT REWARDS

FOR A

Little Work.

EVERYBODY WANTS ONE OR MORE OF THE MANY

GOOD THINGS

In our Premium List.

The Publishers of the *American Agriculturist* take pleasure in presenting their new general Premium List for 1877. The Premiums which they have offered in past years have engaged the attention of a very large number of persons of all ages and both sexes. Many thousands have secured Premiums, and very many of these, who at first had small hopes of success, have been themselves astonished at the ease with which they have raised large clubs and secured one or more of the valuable articles here offered.

[*Read the Table of Premiums in next column and the notes below it.*]

Explanatory Notes.

N. B.

Read and carefully Note the following Items: The next Table tells the *name* and *cash price* of each article, and, (in the last column but one), gives the number of names sent in at the regular price of $1.60 a year that will secure any premium article. (The last column gives the number of names at the lowest club price for 20 or more names, that is $1.10 each. Some persons quickly raise large clubs by taking all the names at $1.10 each, and themselves pay the difference, 50 cents each, and even thus get the premium articles very cheaply.) (*a*) All subscribers sent by one person count, though from several different Post-offices. But....(*b*) Tell us with each name or list of names sent, that it is for a premium....(*c*) *Send the names as fast as obtained*, that the subscribers may begin to receive the paper at once. You can have any time you wish up to next July, to complete your list....(*d*) Send the exact money with each list of names, so that there may be no confusion of money accounts....(*e*) Old and new subscribers all count in premium clubs, but a portion, at least, should be new names; it is partly to get these that we offer premiums to canvassers....(*f*) Specimen Numbers, etc., will be supplied free, as *needed* by canvassers, (when 3 cents per copy is furnished to pre-pay postage), but they should be used carefully and economically, and where they will *tell*....(*g*) Remit money in Checks on New York Banks or Bankers, payable to order of Orange Judd Company, or send Post-office Money Orders. If neither of these is obtainable, Register Money Letters, affixing stamps both for the postage and registry; put in the money and seal the letter in the presence of the Post-master, and take his receipt for it. Money sent in any of the above ways is at *our* risk; otherwise it is not.

Table of Premiums.

[In the following table is given the price of each article, and the number of subscribers required to get it *free*, at the regular rates of $1.60 a year, and also at the club rates of $1.10 a year, postage included, which is prepaid in all cases *by the Publishers.*]

TABLE of Premiums and Terms For Volume 36—(1877).

Open to all—No Competition.

No.	Names of Premium Articles.	Price of Premiums.	Number of Subscribers required at $1.60	or at 1.10
1	*Put. Magic Bellhead Pencil (Ludden & Taylor)*	$ 1 50	4	....
2	*Ladies' Magic Charm Pencil (do. do.).*	$ 2 00	5	20
3	*Gents' Magic Charm Pencil (do. do.).*	$ 3 00	8	30
4	*Gold Pen, Telescopic Case (do. do.)..*	$ 2 50	7	27
5	*Gold Pen and Pencil, Telescopic Case, Elegant (do. do.)*	$ 5 50	13	37
6	*Centennial Magic Pencil (do. do.)*	$ 3 00	8	30
7	*Patent Telescopic Gold Pen and Pencil (do. do.)*	$ 6 50	15	45
8	*Knives and Forks (Patterson Bros.)*	$14 75	22	73
9	*Knives and Forks (do. do.)*	$18 50	28	95
10	*Carver and Fork (do. do.)*	$ 3 75	9	32
11	*French Cook's Knife, Fork, and Steel*	$ 3 75	9	32
12	*Pocket Knife (Meriden Cutlery Co.)..*	$ 1 50	4	....
13	*Pocket Knife (do. do.)..*	$ 2 00	6	22
14	*Pocket Knife (do. do.)..*	$ 2 75	7	27
15	*Ladies' Pocket Knife (do. do.)..*	$ 2 00	6	22
16	*Multum in Parvo Knife (do. do.)..*	$ 3 50	8	30
17	*Boy's Wagon (C. W. F. Dare)*.....	$ 5 00	13	37
18	*Patent Celebrated Propeller Velocipede, (C.W. F. Dare.)*.....	$ 8 00	16	52
19	*Crandall's* **John Gilpin**.....	$ 1 00	3	....
20	*Crandall's Masquerade Blocks*.....	$ 1 00	3	....
21	*Crandall's* **Acrobats**.....	$ 1 00	3	....
22	*Crandall's Building Blocks*.....	$ 2 00	5	20
23	*Crandall's* **Menagerie**.....	$ 2 00	5	20
24	*Case of Scissors (U.S. Steel Shear Co.).*	$ 4 00	10	34
25	*Terrestrial Globe [Schedler's & Steiger)*	$ 3 00	8	30
26	*Combination Ten-pin Alley (Horsman)*	$ 2 50	7	27
27	*Pair of Skates (Patterson Bros.)*.....	$ 3 50	8	30
28	*Doll's Cottage Chamber Set (Dare)*...	$ 4 00	9	32
29	*Child's Self-operating Swing (do. do.).*	$ 4 00	9	32
30	*Improved Table Croquet (Horsman)*	$ 3 00	8	30
31	*Utility Adj. Table (Lambie & Sargent)*	$ 8 00	16	52
32	*Boudoir Clock (S. B. Jerome & Co.)...*	$ 3 50	8	30
33	*Houchin's Improved Patent Pocket Cook Stove*.....	$ 1 50	4	....
34	*Self-adjusting Gold-plate Watch Key, (J. S. Birch.)*.....	$ 1 00	3	....
35	*Pocket Tool Holder (Miller's Falls Co.)*	$ 1 00	3	....
36	*Piano, Splendid 7-oct. (Steinway & So's)*	$650 00	625	1630
37	*Tea Set (Lucius Hart Man'fact'g Co.)..*	$50 00	66	225
38	*Ice Pitcher*..... *(do. do. do.)*	$16 00	24	80
39	*Casters*..... *(do. do. do.)*	$ 9 00	17	54
40	*Cake Basket*..... *(do. do. do.)* ...	$12 00	19	65
41	*Revolving Butter Cooler (do. do.)*	$ 8 00	16	52
42	*One Dozen Teaspoons (do. do.)*	$ 6 00	15	45
43	*One Dozen Tablespoons (do. do.)*	$12 00	19	65
44	*One Dozen Table Forks (do. do.)*	$12 00	19	65
45	*Child's Cup (do. do.)*	$ 2 75	7	27
46	*Child's Knife, Fork & Spoon (do.)* ...	$ 5 00	12	37
47	*W. S. Blunt's "Universal Force Pump"*	$12 00	19	65
48	*Moore's Floral Set (Moore Man'f'g Co)*	$ 1 00	3	....
49	*Cahoon's Broadcast Seed-sower*.....	$ 5 00	12	37
50	*Bracket Saw (Millers' Falls Man'f Co.*	$ 1 25	4	....
51	*Payson's Indelible Ink—Pen, etc*.....	75	3	....
52	*Excelsior Pocket Microscope (Bausch & Lomb Optical Co.)*.....	$ 2 75	7	27
53	*Abbott Pocket Microscope (L.G. Abbott)*	$ 1 50	4	....
54	*Silver Watch (American Watch Co.)..*	$30 00	44	144
55	*Garden Seeds & Flower Bulbs (select'n)*	$ 2 00	6	22
56	*Planet Jr. Combined Drill & Hoe (S. L. Allen & Co.)*.....	$15 00	22	75
57	*Breech-loading Pocket Rifle (Stevens)..*	$16 00	24	80
58	*Sporting & Hunting Rifle (Remington)*	$32 00	48	156
59	*Double Barreled Breech-loading Gun (E. Remington & Sons)*.....	$50 00	66	225
60	*Creedmoor Long Range Rifle (E. Remington & Sons)*.....	$100 00	110	330
61	*Turn-table Apple Parer (Goodell Co.).*	$ 1 00	3	....
62	*Climax Apple Corer & Slicer (do.)*	$ 1 00	3	....
63	*Family Cherry Stoner (do.)*	$ 1 00	3	....
64	*Bay State Apple Paring and Slicing Machine (Goodell Co.)*.....	$ 1 50	4	....
65	*Sewing Machine (Remington)*.....	$70 00	80	208
66	*Reid's Patent Butter Worker*.....	$10 00	18	58
67	*Family Scales (Fairbanks & Co.)*.....	$14 00	21	70
68	*Washing Machine (Doty's)*.....	$14 00	21	70
69	*Clothes Wringer (Best—Universal)*	$ 8 00	16	52
70	*Worcester's Great Illust'ed Dictionary*	$10 00	18	58
71	*Any back Volume Agriculturist*	$ 1 75	.....	20
72	*Any Two Back Volumes do.*	$ 3 50	.....	29
73	*Any Three do. do. do.*	$ 5 25	13	37
74	*Any Four do. do. do.*	$ 7 00	15	47
75	*Any Five do. do. do.*	$ 8 75	17	54
76	*Any Six do. do. do.*	$10 50	19	61
77	*Any Seven do. do. do.*	$12 25	21	68
78	*Any Eight do. do. do.*	$14 00	23	74
	—(Each add'l Vol. at same rate.)			
79	*Twenty Vols. XVI to XXXV.*	$35 00	47	162
80	*Any Back Vol. Agriculturist*	$ 2 50	.....	24
81	*Any Two Back Volumes do.*	$ 5 00	.....	36
82	*Any Three do. do. do.*	$ 7 50	16	48
83	*Any Four do. do. do.*	$10 00	18	60
84	*Any Five do. do. do.*	$12 50	21	71
85	*Any Six do. do. do.*	$15 00	24	82
86	*Any Seven do. do. do.*	$17 50	27	92
87	*Any Eight do. do. do.*	$20 00	30	102
	—(Each add'l volume at same rate)			
88	*Twenty Vols. XVI to XXXV.*	$50 00	68	220
89	*—A* **$10** *Library (Your Choice.)*	$10 00	18	58
90	*—A* **$15** *Library do.*	$15 00	24	85
91	*—A* **$20** *Library do.*	$20 00	31	106
92	*—A* **$25** *Library do.*	$25 00	38	125
93	*—A* **$30** *Library do.*	$30 00	44	144
94	*—A* **$35** *Library do.*	$35 00	50	162
95	*—A* **$40** *Library do.*	$40 00	56	177
96	*—A* **$45** *Library do.*	$45 00	62	192
97	*—A* **$50** *Library do.*	$50 00	68	207
98	*—A* **$60** *Library do.*	$60 00	80	237
99	*—A* **$75** *Library do.*	$75 00	100	282
100	*—A* **$100** *Library do.*	100 00	125	360
101	*—A Choice of Good Books. (See Description.)*.....			

Unbound, post-paid. *Bound. Post-p'd.* *All sent paid through Express Co.*

☞ *Every Premium article is* **new** *and of the very* **best** *manufacture. No charge is made for packing or boxing any article in our Premium List. The Premiums,* **Nos. 1 to 7, 12 to 16, 19 to 22, 24, 32 to 35, 50 to 53, 55, 71 to 101,** *inclusive, will each be delivered* **FREE** *of all charges, by mail or express (at the Post-office or express office nearest the recipient) to any place in the United States or Territories.—The other articles cost the recipient only the freight after leaving the manufactory of each, by any conveyance desired. An* **Illustrated Descriptive Premium List** *sent* **free** *to applicants.*

containing a great variety of Items, including many good Hints and Suggestions which we throw into smaller type and condensed form, for want of space elsewhere.

Continued from p. 49.

The Langshan Fowls.—"E. D. K.," Brenham, Texas. We distinctly stated, when we gave the portrait of the Langshan fowls, that there were *none in America*. Our impression is that the Black Cochin is so near to this fowl as to be practically the same. Certainly the Black Cochin, sold by R. Kirby, 12 Courtlandt St., New York, meets all the points of the Langshan.

Corn in Drills.—"G. B.," Dunn Co., Wis. The increase of crop in planting corn in rows instead of in squares, is 25 per cent. With the best farmers in the East this method is general. Our own fields, planted in this manner, have been freer from weeds than many of our neighbor's, who planted in check rows. The rows are generally three feet apart, and the seed may be so dropped to give one stalk every foot, or two stalks every 18 inches in the row.

Cribbing and Worms.—"A. K.," Fitzwilliam, N. H. Cribbing may very probably be an indirect consequence of worms in the intestines. The round white worms may be got rid of by giving half a pint of linseed-oil every morning for a few days; but a more effective treatment is to give one dram tartar emetic, half as much ground ginger, and sufficient linseed meal to make a ball with boiling water. This is put down the throat in the usual manner. After giving this ball every day for a week, give half a pint of linseed oil; then repeat the balls and the oil, and give a tea-spoonful of copperas, (*green* vitriol), in the feed every morning after that, until the horse recovers.

Cause of Heaves.—"P. G.," Portland, Oregon. One frequent cause of heaves in horses, is the dust from over ripe or mildewed hay: this causes irritation, which finally ends in debility of the nerve which controls the action of the respiratory organs. The disease may be greatly relieved, if not cured in time, by cutting the hay and wetting it before feeding it, and giving no dry feed whatever. Occasional doses of half an ounce of copperas, with equal quantities of ginger and gentian roots powdered, are helpful temporarily.

Floor for a Stable.—"J. R.," Schoharie Co., N. Y. A water-tight stable floor may be made as follows. Lay dry, tongued and grooved, inch-and-a-half plank, with the joints put together with hot gas tar or pitch, for the first floor; saturate this thoroughly with hot tar, laying upon it a second floor of plank while the tar is hot. The seams should be well filled with the tar. No water will pass through this floor, and it will be very durable; the more so if the upper floor is well coated with hot tar and then sanded.

How to Apply Ashes and Salt.—"J. R.," Clinton, P. of O. Unleached ashes may be applied at the rate of 40 or 50 bushels per acre upon land that is full of weeds. The more vegetable matter there is in the soil, the more ashes it will bear. Salt may be used at the rate of 300 to 400 lbs. per acre. Sawdust is quite useless until thoroughly rotted. By mixture with liquid from the stables, it may serve as a useful vehicle for this valuable fertilizer.

Fowls Eating Feathers.—"L. H. C.," Hamilton, Va. At this season fowls have much idle time, and get into mischief in consequence. Being deprived of animal or nitrogenous food, they take as the best substitute the feathers from each other's necks. The remedy is to give them a sheep's pluck or liver to peck at, hanging it up within reach, and to give them wheat scattered in the earth or litter of their houses. This will give them food, and work to occupy their time.

A Famous Orange Tree died recently in France. The story goes that in 1421 the Queen of Navarre gave her gardener the seed to plant, and that this tree was the result. The tree managed to survive various removals, due to political changes, and was 455 years old when it died, having long been the largest and most fruitful tree in the orangery at Versailles.

"Sweeny in the Shoulders."—"J. W.," Washington Co., Oregon. What you call "sweenied in both shoulders," is a wasting away of the muscles of the shoulder blade, resulting from disease in the

feet and legs, or sprain of the shoulder. To remedy the defect, the cause must be discovered and removed. It would be well to examine the horse very carefully, pressing every part of the legs and shoulder in turn, to find a tender spot, or the presence of heat and inflammation. When this is found it will indicate the seat of the trouble, and remedies may be applied. Rest will only increase the defect, and the animal should be exercised regularly, although it be lame.

Effect of Early Laying—Early Hatching.—"G. K. S.," Paterson, N. J. The laying of eggs now will have no tendency to "weaken the eggs" that are laid later. The effect of early laying is, that the hens become broody earlier than they otherwise would, and then stop laying. By having a stove in an airy room, chickens can be raised in February. The floor should be well sanded, and there should be a sunny window in the room if possible.

A Barren Cow.—"H." A barren cow should be fattened for the butcher; if she has failed to breed for two years, it is not worth while to keep her longer. A cow will consume her own value in feed if kept for one year and make no returns.

To Use Corn Stalks.—"J. H. C., Jr.," Cincinnati. If corn stalks are cut up in a fodder cutter with rollers that bruise them, and are then wetted and sprinkled with meal, they will be eaten by either cows or horses. That is, if the stalks were well saved and are in good condition. Feed at morning and night, and give no hay with them. The hay should be given by itself at noon. When thus treated, we have never found any difficulty in successfully using corn stalks.

The Use of Lime.—"A Subscriber," Chambersburg, Pa. The idea that heavy applications of lime to the soil are wasteful, is a correct one. A few years ago, we applied 50 bushels per acre to a 13 acre field near the house, and before long the water in the well, which was previously soft, became very hard. The lime was evidently dissolved in great part, and carried into the subsoil and lost to the crop. Many intelligent farmers use now 10 to 15 bushels per acre in place of 50 bushels, as previously used. When a field has been largely limed, much of the lime will be turned up in the bottom of the furrow at the next few plowings, showing that a large portion sinks into the soil. This is wasted to a great extent, and if five dressings, of 10 bushels per acre each, are applied in ten or fifteen years, or every two or three years, to the wheat and corn crop, instead of 50 bushels once in five years, as is usual, it would to our mind be just as beneficial as the large dressing, and much more economical. No exact rule can be laid down, because heavy soils will take more lime than light ones, not that they need it perhaps, but they hold it if given; but 10 bushels per acre could harm no soil.

A Dairy Journal.—"S. I.," Montgomery Co., Ohio. There is no journal published in the interest of the dairy especially, and there probably will not be, as special journals of such a character as a rule, cannot be made profitable to the publishers. The *American Agriculturist* contains as much relating to the dairy as any special journal probably could afford to give, besides all its other valuable contents.

Ventilation of a Smoke House.—"J. D. L.," Barton Co., Ga. But little ventilation is needed for a smoke-house; a smouldering fire that will make a dense cool smoke is what is wanted. If there are any openings needed for the admitting of air, to sustain the necessarily slow combustion, they must be very small, and may be at the bottom instead of at the top, where smoke only is wanted. Flies must be kept out by all means, and if any ventilating openings are made, cover them with fine wire gauze, and provide something to close them with when the fire is not used. To protect the meat, the house must be quite close and dark.

Toulouse Geese.—"D. L. C.," Jamestown, Pa. W. H. Todd, of Vermillion, Ohio, makes a specialty of raising all sorts of water fowl. The geese he exhibited at the Centennial were very fine indeed.

To Pack Eggs Safely.—"F. W. R.," Cuckoo, Va. To pack eggs safely for transportation, place them in layers in a box or barrel, with at least one inch of oats or finely cut straw or chaff between them. If sent in small quantities for hatching, have a flat box made and divided by partitions of thin stuff or pasteboard into separate cells; pack one egg in each cell, first wrapping in dry moss, cotton, or oat straw, in such a way that the wrapping cannot be displaced. A layer of the packing should be placed over the cells beneath the lid, so as to keep the eggs firmly in their places. We have known eggs to hatch perfectly well after 1,500 miles of travel, that were packed in a barrel with oats. Most of the failures to hatch are not due to the transportation so much as to infertility of the eggs from keeping the fowls shut up, from close breeding, or other causes.

Guernseys or Jerseys.—"J. Y. A.," Taunton, Mass. If we were to keep but one cow for family use, we would choose pure bred or a good grade Jersey, raised by some breeder who makes a specialty of breeding such cows. Mr. Thomas Fitch, of New London, Conn., makes the breeding of family cows a business, and breeds both pure Herd book stock and grades of Jersey cows. A good Guernsey is as good for butter as a Jersey, but the breed is not so popular for family cows.

Extension Ladders.—"G. H. G.," Rochester, Mass. The extension ladders as long as 30 ft. that we have seen, have three sections, the upper two raised by a cord and windlass arrangement upon the lower one. These are patented, and so are those used by or intended for firemen.

How to Feed Young Pigs.—"A. G. D.," Delaware Co., Pa. When milk is not to be procured for feeding young pigs, some care is to be exercised lest they be overfed with grain. A mixture of wheat bran, or coarse wheat middlings, with some crushed oats made into a thick slop or thin mush, would be greatly preferable to corn-meal. Linseed oil cake-meal at $40 a ton is too costly to feed pigs upon. A little of it as a change might be given with benefit.

How to Feed Old Sheep.—"M. G.," Lehigh Co., Pa. Examine the mouth of old sheep that will not fatten; perhaps the teeth are so worn down that the food cannot be perfectly masticated. When sheep become very old, it is sometimes impossible to put fat upon them, and then it becomes a question if the feed eaten does not cost more than the sheep are worth. If so, the proper course is obvious. Linseed oil cake-meal is good for fattening sheep, along with some clover hay.

Profit of Sheep Keeping.—"W. S.," Meriden, Conn. The profit from a flock of sheep, counting the increase, should be about 75 per cent. A skillful manager may make more than this. In the Western States, Kansas, Nebraska, Colorado, and elsewhere, the wool should pay the expenses, leaving the lambs as clear profit. The increase of lambs depends upon the management, but 75 lambs to 100 ewes are generally raised.

House for 1,000 Fowls.—"A. McE.," Eau Claire, Wis. No person experienced in poultry raising would build a house for 1,000 fowls. When crowded together in such numbers, fowls would inevitably die from disease. This number could be kept in six separate houses, such as are described in a little book entitled, "An Egg Farm," published by the Orange Judd Co., for 75 cents. If plans and specifications for these houses were needed they could be procured for a moderate sum from any builder.

Sowing Clover Seed on the Snow.—"F. S.," Meramec, Mo. If the ground is in proper condition, it will answer well enough to sow clover seed upon the last snow. But if it is not perfectly prepared, it will be better to wait and harrow the ground as soon as the surface is dry, and then sow the seed while the marks of the harrow-teeth remain. The seed will be covered by the earth settling down into the little furrows.

The "Florida Fever."—A correspondent in New England writes that his neighbors have the "Florida Fever" very generally, and wishes to know if we think he "could succeed in raising vegetables in Florida."—We receive numerous letters asking advice about moving, not to Florida only, but to various localities, but that seems to be uppermost at present. We would like to see Florida fill up with industrious cultivators, and we would be glad if every one of these correspondents could better his condition, but we must positively decline to give advice which shall induce any one to leave his present home and occupation, and go into a business about which he knows nothing, in a locality unlike, in almost every respect, the one to which he is accustomed. Those who recollect the California excitement know how easy it is to get up an emigration fever. This state of mind, in which everything favorable as to the project is magnified, and all that is unfavorable is overlooked, is not the proper one in which to decide on so important a move. We have not the least doubt that our friend can "succeed in raising vegetables" in Florida, but that is an unimportant point compared with what will he do with them when he has raised them. If he goes to a place where there is no regular and quick transportation to northern markets, he might as well open an ice-cream saloon in Greenland, for all the money he would make. There are many who can better themselves by going to Florida, but in going there or elsewhere, they should first visit their proposed new home, or let a company of neighbors send the clearest headed, most common-sensible of their number to visit it and report. Do not decide while the "fever" is on. Recollect that going to Florida will not change the *man*: the "ne'er do well" will be the same there as at home. In Florida, as at home, it is patient, well-directed labor that will tell. The best interests of that State do not call for people with the fever on them—they need people who, when they come, come to stay.

"The Tanning Plant Again."—"C. W. G.," Grama, Pa. The so-called "Tanning Plant," of Nebraska, Iowa, and other Western States, is *Polygonum amphibium*. To your question "would it not pay to get the seeds and try if it can not be profitably grown in the East?" we have already replied, by stating it grows in every Northern State, from the Atlantic to the Pacific. One form of it is truly aquatic, and found in ponds, while another flourishes in wet soil. We have no idea that it would in any case pay to cultivate it, but it is possible that in localities where it grows naturally in abundance, it might pay to gather it, and use it in the absence of other tanning materials. There are several plants vastly richer in tannin, that it would be preferable to try, if it would pay to cultivate any.

What "Sport" Costs in England.—Not long ago the "Mark Lane Express" gave the hunting statistics for one County only, that of Lancashire. It is estimated that there are in that County 20,000 hounds, harriers, and dogs of various kinds; 1,000 huntsmen; some 3,500 men employed in the stables and kennels, and that the annual expense to the masters is £350,000, or in round numbers $1,750,000. No account is here taken of the damage to farmers, or other incidentals.

Giving Credit for Plants.—As we do not know the rules under which the Royal Horticultural Society (Eng.) gives certificates for the introduction of new and meritorious plants, we can not complain of their action, but their rules must be wrong. Thus, among the certificated plants in 1876, we find *Eulalia Japonica variegata*, for which a certificate is given to Messrs. Veitch & Sons. If the certificate merely indicates who first introduced the plant into England, it is all right, but if the one who first brought it into *cultivation*, it is all wrong. We figured this Eulalia in Hearth and Home in 1871. It was introduced from Japan, some years before, by Mr. Thomas Hogg. It seems to us quite the reverse of fair, that other persons, who accidentally acquired the plant by purchase from some one to whom Mr. Hogg had supplied it, should stand on the records as having received a certificate for it. If the certificate only shows the plant was exhibited by the person who receives it, then the one who introduced it should be honored in some way. Mr. Thomas Hogg has added a great many fine plants to our collections, and has distributed many of them among plant lovers with a liberality most unusual. While others with his opportunities would have received a handsome sum for the plants, he has worked, like the true horticulturist that he is, without looking constantly through gold-bowed glasses, and we insist that, if he has not made money, he shall at least have proper credit every time that it is due.

Petroleum in Tobacco Culture.—It is a common custom to cover the tobacco seed-beds with brush, and burn it off, to kill the weed-seeds before sowing. According to the "Titusville Herald," petroleum is used for this purpose. It is applied evenly to the bed by means of a watering pot, at the rate of one gallon to 100 square yards, and then set on fire.

The Florida State Fair.—Florida is far in advance of other States with her fair, which will be held at Jacksonville on the 22th inst. This announcement is suggestive of the wonderful variety of climate our country presents. While the farmers in one part are enjoying their fire-side comforts, in another they are showing their best bananas, oranges, and pine-apples, and the products of the kitchen and flower-gardens.

Seeds and Sea-Water.—Experiments have been made in Europe upon the germinating power of seeds after an immersion of 13 months in sea-water. Out of 251 species tested, only three came up. These were Endive, Black Medic or Nonsuch, and an *Apium*, whether Celery or some other species is not stated.

How to be a "Professor."—One of the most eminent men we ever knew, a professor in one of our first colleges, and a M.D., also, did not like to have his friends address him as "Professor"; upon inquiry why he disliked the title, we learned that every day he passed a barber shop, where the barber's sign stated that he was a "Professor of the Tonsorial art." Indeed,

the title of "Professor" has lost most of its former distinction. Once it was only given to the holder of a chair in a regular university or college. In some States it is now given to every school teacher, and it is used for all sorts of persons, down to boxers and bruisers, who are "Professors of the manly art of self-defence." Still we did not know how readily the title was acquired, until we saw the circular of some gimcrack sold by agents. In setting forth the inducements to undertake the agency of the thing, the "outfit" is described; the articles the outfit is to contain are enumerated, and include "one thousand circulars with your name (as professor if you wish) printed on them." The whole outfit costs only $30, and one can get a lot of gimcracks, and be a professor ("if you wish") besides.—Let us all be professors.

The Japanese Persimmon, *Diospyros Kaki*, fruited with Mr. G. F. Wilson. It was tried by the members of the Royal Horticultural Society—result a general pucker—only the account put it "wry faces." Such an indignity must be looked into, and *Kaki* was at once analyzed. Over 2 per cent of tannic acid found. Now we know what was the matter. Any Southern darkey would have said "dem 'simmins wasn't ripe." It must have been a very funny thing to have seen that august body with its mouth involuntarily in a whistling position. We doubt if this fruit will completely ripen in England. We tasted of the first fruit that matured here, and there was no trace of astringency.

Bitter Rot in Apples.—This difficulty appears to be on the increase, to judge from the inquiries that are made concerning it. Light brownish spots appear in the flesh of the apple, and these are of the most intensely bitter taste, while the unchanged portions are of their usual character. If any proper investigations have been made as to the cause, we have not heard of them. Cases are recorded in which manuring the trees has been followed by a recovery. So far as is known at present, we can only work on general principles; assuming that there is a lack of proper nutrition, it is safe to see to the general health of the trees. On poor soils apply manure, and on those apparently fertile, give lime, or ashes, or both. Until the precise cause is known, to apply special remedies will be working in the dark.

Fish Guano.—The Moss Bunkers, or Menhaden, are not caught, as many suppose, with the chief object of converting them into a fertilizer. Fish scrap or fish guano, a valuable fertilizer, is only a secondary product. The principal object of the business is the oil, which, since the decline in the supply of whale-oil, is now put to many uses for which that was formerly employed. After the oil is pressed out of the steamed fish, the residue, dried and ground, is put on the market as fish guano. There are now about 75 fisheries, in which some $3,000,000 are invested, and these employ 250 sailing vessels, 30 steamers, and nearly 4,000 men. The oil product of last year (1876) is estimated at 3,000,000 gallons, and that of scrap, or guano, at 40,000 tons.

Government Land in Florida.—"J. G. D.," Cambridgeport, Mass. There are a plenty of U. S. Government lands in Florida, subject to entry under the homestead act, on the same conditions as in the Western States: or a person can precmpt, and pay $1.50 per acre. The cost of a homestead is only the office-fees and the expense of surveying, in all about $18 for 160 acres.

"The Illustrated Adelaide News."—Nothing more strikingly shows the wonderful progress made by that far off country, Australia, than to receive from there an illustrated monthly paper. Seven of its 16 pages, each nearly twice as large as this page of the *American Agriculturist*, are quite filled by engravings, not copied from English papers, but original, with a strong local flavor. If some of the engravings do not show quite so fine work as those in older journals, they are remarkably spirited in drawing, and highly creditable. Local shipwrecks, fights with the natives, hunting scenes, new buildings, and Australian scenes make up a variety, and two views of Australian exhibits at the Centennial, show an enterprise that deserves success.

Japanese Botany.—The Japanese are making such wonderful progress in adopting whatever is desirable in the life of other nations, that we forget that they had by themselves reached a high state of culture, which prepared them for this sudden advance. Thus, their plants have been studied by native botanists, and classified according to a system of their own, and their illustrated botanical works represent the plants in figures which show great skill and fidelity to nature. One of our pleasantest mementoes of the Centennial Exhibition, is a work presented by one of the Imperial Commissioners, containing specimens of the wood of 100 native trees and shrubs. Each species is represented by a cross-section, and mostly by two length-wise sections cut different ways of the grain. The sections, cut as thin as writing paper, are attached to the pages of a book; at the top of the page is printed, in English type, the Japanese name, the botanical name, according to our system, and that of the family to which it belongs. In a column at the right hand of the page, is descriptive matter in Japanese characters. The book has a very full index, and its reading matter *looks* very instructive. The whole forms a most interesting collection, the like of which but few other countries can show.

To Hull Clover-Seed.—"J. J.," Green Co., Wis. Clover seed may be thrashed and hulled in great part without a huller, by the following method. Take out the concave of a thrashing machine, and replace it with a piece of oak plank in which grooves have been plowed lengthwise with a gouge, chisel, or a grooving-plane. Feed the clover into the machine so as to keep it crowded full, and hang a bag in front of the discharge to keep the chaff from leaving the machine freely. This will cause a great deal of rubbing in the machine, by which most of the seed will be hulled. Clean with the fan, with a light draft, or toss the chaff with a fork or rake, and rake off the top, keeping the bottom for sowing. Or else thrash and rake off the coarse chaff, and sow the fine chaff, in which all the seed will be found.

Fistula on the Jaw.—"F. A. P.," Blue Earth Co., Minn. The difficulty of healing a running sore upon the face of an animal, is probably due to a disease of the bone beneath it. To reach this, through a very small pipe inject a few drops of Carbolic Acid in a spoonful of water, by means of a small common syringe. Do this twice a day, until the discharge ceases, then inject a few drops of Compound Tincture of Benzoin, twice a day, until the hole closes. If this does not succeed, open the hole with a knife, down to the bottom, and then treat it as above, keeping a plug of lint in the opening until the bottom heals.

Spavin Cure.—"R. S. E.," Talbot Co., Md. It is impossible to say what may be the effect of any application for spavin, without knowing of what the remedy consists. But it is very safe to say that no remedy whatever can be expected to succeed in all cases, and anything that is claimed to cure every case to which it is applied, will fail to do what is promised. There are some cases of spavin, such as when the bony growth is fully formed, that can never be cured by outward applications.

Small Farm Grist Mills.—"W. D. R. M.," Savannah, Ga. The various mills illustrated in the *American Agriculturist* recently, are made of different sizes, some of them small enough for hand-power. To procure one to suit, write to the manufacturers, whose cards appear in the *American Agriculturist*, for catalogues with prices, and select what seems most suitable.

Difficulty of Breathing in a Horse.—"F.," Warren Co., Ohio. When a horse breathes with difficulty while working in harness, it may indicate a disease of the lungs, or a pressure of the collar; which it is, may easily be tested. As the horse is hide-bound, and troubled with some affection of the kidneys, it is more probable that the difficulty of breathing originates in a general poor condition of health; this may arise from indigestion, or there may be tuberculosis of the lungs. It might be well to give him a pint of linseed oil daily, for a few days, to clear the bowels, and then feed bran-mashes, with crushed oats and linseed meal, mixed with cut hay moistened. One ounce of ground gentian root might be given in the night's feed. If tuberculosis or consumption is the cause, there is no help for the animal.

Catalogues Received.

The Catalogues for the spring trade have already began to appear. If any dealers who have sent their lists fail to find them enumerated below, it is because they came to hand too late. The paper goes to press on the 15th of the preceding month, and Catalogues that did not reach us by Jan. 15th must lie over until March.

NURSERYMEN.

CHARLES BLACK & BRO., Hightstown, N. J. General stock of fruit and ornamental trees, with special attention to peaches.

JOHN S. COLLINS, Moorestown, N. J.—A full list of small fruits, peach and other fruit-trees, and berry boxes and crates.

ROBERT DOUGLAS & SONS, Waukegan, Ill., offer tree seeds, and evergreen and other forest trees either as young seedlings from the seed bed, or several times transplanted, and several years old.

P. H. FOSTER, Babylon, (L. I.) N. Y.—General fruit and ornamental trees, hedge-plants, etc.

A. HANCE & SON, Red Bank, N. J.—A select retail list of fruit-trees and small fruits, describing novelties, especially among peaches, raspberries, and strawberries.

E. W. KRAUSE, Waco, Texas.—Fruit and ornamental trees, small fruits and flowers, selected with reference to the climate of Texas.

D. S. MARVIN, Grape-vine Nursery, Watertown, N. Y. A special list of grapes selected for a northern climate.

E. P. ROE, Cornwall-on-the-Hudson, N. Y., sends a compendious circular of strawberries, raspberries, and other small fruits, which gives useful talk about them, and their prices.

SEEDSMEN.

W. H. CARSON, 125 Chambers st., New York, sends out his first catalogue, which is as neat as a row of new pins. In both vegetable and flower seeds he judiciously confines himself to a selection of the best. A Calendar of Operations and various tables increase its usefulness.

J. A. FOOTE, Terre Haute, Ind., has the leading varieties, and makes a specialty of the "100 days Tomato," noticed elsewhere.

DAVID LANDRETH & SONS, Philadelphia, Pa.—This long-established house enjoys a reputation which each year confirms. Their "Rural Register and Almanac" is as fresh and useful as ever, and not the less so because it contains their price list.

J. M. PHILIPS, Mercersburg, Pa. A catalogue of seeds largely grown by himself, with directions for culture.

J. B. ROOT, Rockford, Ill.—Before the sudden death of Mr. Root, mentioned last month, he had prepared his "Garden Manual and Catalogue," which is as fresh and useful as ever. The business will be continued by Mrs. Root, aided by his long-time foreman.

R. H. SHUMWAY, Rockford, Ill., has an abundantly illustrated Catalogue, with cultural directions, largely of seeds of his own raising, which, from the array of testimonials, have pleased many persons.

CHARLES SIZER, Mount Lebanon, Columbia Co., N.Y., sends his catalogue of Shaker's seeds. It is well illustrated, in clear large type, on fine paper, with no air of antiquity about it, yet we are informed that the establishment dates back to 1795. Mr. Sizer can go to the head.

J. M. THORBURN & Co., No. 15 John st., N. Y., send their annual catalogue of vegetable, agricultural and tree seeds, which is as full and concise as usual. It is very full in grass seeds, with descriptive notes.

JAMES VICK, Rochester, N. Y., sends out so many publications that it is difficult to keep the run of them. The one before us is a catalogue purely, well illustrated, exquisitely neat, and as full as it can stick.

FLORISTS.

BELLEVUE NURSERY Co., Paterson, N. J., H. E. Chitty, Supt. A full stock of greenhouse and bedding plants, with novelties, and a general vegetable & flower-seed list.

BENJ. A. ELLIOTT & Co., Pittsburgh, Pa.—Greenhouse and bedding plants, sent in collection or singly.

GREENBROOK AND PATERSON CITY NURSERIES, Paterson, N. J., send a comprehensive business card of greenhouse stock, upon the opposite side of which is a calendar surrounded by a handsome border of flowers.

TYRA MONTGOMERY, Mattoon, Ill., sends two lists, one of a general collection and one of roses, which have long been a specialty at this establishment.

THOMAS PRAY, JR., Central Falls, (which is a suburb of Providence), R. I., offers bedding plants, select ornamental trees and flower seeds.

IMPLEMENTS, MACHINERY, FERTILIZERS.

W. H. BOWKER & Co., Boston, issue a catalogue of special fertilizers, expressly prepared for all crops which have been satisfactorily tested; including wheat, corn, oats, potatoes, grass and vegetables. Also of the Brighton Fertilizers made from blood, bone and refuse meat from the Brighton Slaughter-houses. These are warranted pure. Catalogues sent free by mail.

DEERE & COMPANY, Moline, Ills., keep the farmer advised of their excellent plows and cultivators, by furnishing him with a pocket almanac, memorandum and expense book—both neat and useful.

LEONARD & SILLIMAN, Bridgeport, Conn. Burr-stone Mills of various sizes, and Flouring and Grist-mill machinery in general.

WHITMAN & BURRELL, Little Falls, N. Y., manufacture the Economizer Return Flue Boilers and agricultural engines, also a Steam engine and Pump combined, which will raise 30 gallons of water per minute. These machines are in extensive use and are highly recommended.

NASON MANUFACTURING Co., 71 Beekman and Fulton sts., New York. Iron pipes, steam fittings, steam heaters, and Blunt's Universal Force Pumps, also steam engines and a great variety of similar articles.

EUROPEAN CATALOGUES.

GREAT BRITAIN.

WAITE, BURNELL, HUGGINS, London, Eng.—This promising young seed house—only about 300 years old—send their wholesale list, which is as neat and full as usual.

WILSON & RANKIN, Glasgow, Scotland.—A wholesale list of garden and agricultural seeds, especially grasses.

BELGIUM.

AUGUSTE VANGEERT, Gand.—A catalogue of over 150 pages of stove, greenhouse and hardy flowers.

J. VAN DER SWAELMEN, Gendbrugge-Gand, makes Lilies a specialty and offers a great variety.

FRANCE.

LOUIS LEROY, Angers.—This catalogue is as usual full of everything kept in any nursery

VILMORIN, ANDRIEUX & Co., Paris, send their general seed catalogue for 1877, and a special list of novelties in vegetable and flower seeds.—Messrs. Pabst & Esch, 11 Murray st., N. Y., are agents for both these French houses.

PRUSSIA.

ERNST BENARY, Erfurt.—A list of vegetable and flower seeds, with many novelties from a house noted for the excellence of its products.

FREDERICH ADOLPHE HAAGE, Erfurt.—Vegetable, flower, tree and other seeds in immense variety.

HAAGE & SCHMIDT, also of Erfurt, which is a great seed center, require nearly 200 pages for seeds, and another large catalogue for ornamental plants of all kinds.

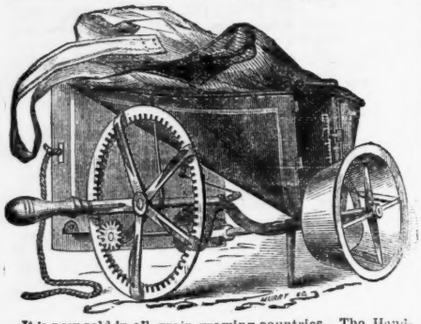
ALLEN'S PLANET Jr.

SILVER MEDAL

Hand Seed Drills and Wheel Hoes, have also been awarded the **Centennial Medal** and **Diploma**, and the *Medal* of the *Great Horticultural Exposition, held at Erfurt, Germany*, besides a large number of *First* Premiums at State and County Fairs. Full Descriptive Catalogue of our whole line of goods *free*. Including our *Wrought Frame Horse Hoe, "Iron Age" Cultivator, Paris Green Duster, Hand Garden Plow, Transplanting Hoes, Corn Knives, etc. Every Farmer* should have a copy, and we want a **live agent** at work, or a club formed in **every town.** Send for **new** terms. *American Agriculturist* Premium. **S. L. ALLEN & CO., 119 S. 4th St., Philadelphia, Pa.**

Cahoon's Broadcast Seed-Sower

is the only practical Broadcast Grain and Grass-Seed Sower known.



It is now sold in all grain-growing countries. The Hand-Machine will sow 30 acres of wheat, or 30 acres of grass-seed in 10 hours, and do the work far better than it can be done by any other means whatever. These machines have been uniformly sold for the past 10 years for $10 a piece, but now we have reduced the price to $5 a piece, and our sales have already increased astonishingly. Send stamp for circular.

GOODELL COMPANY,
Sole Manufacturers, **Antrim, N. H.**

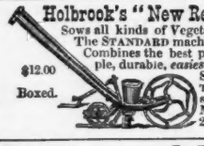
Matthews' Garden Seed Drill

Is the latest production of the inventor of the **Holbrook "Regulator"** and other drills, and is the best in use. It has been **further improved for 1877.** Send for descriptive circular. Manufactured only by **EVERETT & SMALL, Boston, Mass.**

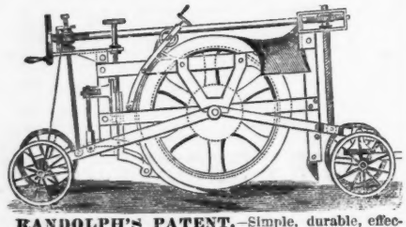
Holbrook's "New Regulator" Seed Drill

Sows all kinds of Vegetable Seeds with regularity. The STANDARD machine. REMODELED for 1875. Combines the best points ever produced. Simple, durable, *easiest handled*, OPEN WHITE SEED CONDUCTOR SHOWS THE SEED DROPPING. Give satisfaction. Circulars Free. Made by E.E.LUMMUS & Co. 20 S.Market St. Boston,Mass.

$12.00 Boxed.



Ditcher and Excavator.



RANDOLPH'S PATENT.—Simple, durable, effective. The work of 50 men with 4 horses and 2 men. Makes Tile and Open Ditches.

STEAM EXCAVATORS.—For Roads, Railroads, Levees, and Canals.—Will dig and deliver at cost of one cent per cubic yard.—Easily cared for and worked.—For circulars, etc., address **Randolph Bros.,** Agents, 111 BROADWAY, NEW YORK.

Horse Powers and Threshing Machines of all kinds a specialty. Send for large Illustrated Catalogue.

The Best Fanning Mill in the World.

BUY THE A. P. DICKEY Fanning Mill.

No good Farmer can afford to market dirty grain.

A moderate quality of grain, well cleaned, brings a better price than the nicest grade in dirty condition.

Address **A. P. DICKEY, Racine, Wis**

Prout's Hoeing Machine.

This new labor-saving machine will hoe tobacco and cotton BETTER than can be done by hand, and corn, potatoes, etc., better than is usually done by hand-hoe. Will pay for itself in one year in hoeing 10 acres of tobacco and cotton, or 20 acres of corn or potatoes. Price, $30. For further information address

THE BELCHER & TAYLOR AG'L TOOL CO.,
Chicopee Falls, Mass.

Also manufacturers of the Self-Sharpening, Lion, and other Feed-Cutters, Corn-Shellers, Plows, Bullard's Hay Tedders, Balance Rakes, etc., etc.

BOGARDUS'S PATENT Universal Eccentric Mills

for **Grinding Bones, Pot Shells, Ores, Old Crucibles, Fire Clay, Guanos, Oil Cake, Feed, Corn** and **Cob, Tobacco, Snuff, Sugar, Salts, Roots, Spices, Coffee, Cocoanut, Tomatoes, Saw-dust, Flax Seed, Asbestos, Mica, Horn,** etc., and whatever can not be ground by other Mills. Also for **Paints, Printers' Inks, Paste, Blacking,** etc.

JOHN W. THOMSON, Successor to JAMES BOGARDUS, Cor. White and Elm Sts., New York.

HARRISON'S MILLS

Grand Medal at Centennial.

Standard Flouring Mill.
Cleaner Grinder and Bolter.
Ordinary size, 9 feet by 4 feet
Capacity 5 bushels per hour.
Finest flour, largest yield.
Cooled by a strong air blast.
Runs at one-tenth the cost
Of the old style mills.
Compact, practical,
Substantial, and very durable.

Standard Grinding Mill.
For all substances wet or dry.
Built of burr stone and iron.
For heavy or light power.
10,000 in operation.
Grind 75 bushels per hour.
Thickest French burr stones.
Double discharge spouts.
Adjustable babbitt boxes.
Solid self-adjusting burrs.

These Mills excel all others, even compared with those of double the size, double the weight, and double the price.

EDWARD HARRISON, Patentee and Sole Manufacturer,
135 Howard Avenue, NEW HAVEN, CONN.

BLAKE'S PATENT Stone and Ore Breaker

Crushes all hard and brittle substances to **any required size.** Also, any kind of STONE for ROADS and for CONCRETE, &c. Address BLAKE CRUSHER CO., New Haven, Conn.

Agents Wanted. Post's Patent Sugar Fixtures. Descriptive Circulars with Samples of EUREKA SAP SPOUTS, and price-list, sent post-paid for 20 cents. Address, **C. C. POST, Burlington, Vt.**

The Anti-Friction Hay Carrier

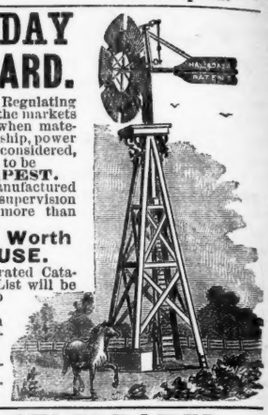
Saves labor and money. It is simple; the grappling positive; it runs on friction rolls, hence will come back on slight incline. The track is inexpensive; the carrier costs but a trifle; **many hundreds are in use.** No trouble about getting over high beams, or to the end of deep bays. Hay is dropped where wanted, and the work of mowing is reduced. **Track should be put up now while barns are full.**

Send for circulars and designs for tracking barn, to **U. S. Wind Engine & Pump Co., Batavia, Ill.,** manufacturers of the Old Reliable Halladay Standard Wind Mill.

SPAIN'S PATENT CHURNS.

Centennial Medal Awarded
In use over 25 years.
Removable Dasher.
Made of White Cedar with galvanized hoops.
Send for circular and prices.
CLEMENT & DUNBAR,
Philadelphia.

HALLADAY STANDARD.



The first Self-Regulating Wind Mill offered the markets of the world, and when material used, workmanship, power and durability are considered, it is acknowledged to be **THE CHEAPEST.**

It has been manufactured under immediate supervision of inventor for more than twenty-two years.

$3,000,000 Worth NOW IN USE.

A 58 page Illustrated Catalogue with Price List will be sent free to all who make application.

Agents wanted in all unassigned counties.

U. S. WIND ENGINE & PUMP CO.
BATAVIA, ILL.

THE CELEBRATED Dexter Spring

Is one of those inventions that commends itself to the **PRACTICAL MAN** as the **COMMON-SENSE SPRING,** being a side-spring without the unpleasant and dangerous side motion of the Concord, and obviating the jerking of the Elliptic. Being without perch, gives independent action to each wheel, making them much more durable. The **SPRINGS** are made of special **CRUCIBLE STEEL,** and are fully warranted.

The **DEXTER** supplies a want long felt by the **Farmer, Business Man,** and **Physician,** as it gives them the easiest riding and most durable **SPRING VEHICLE** known, and much less liable to break than the ordinary spring, on account of quality and form.

Please examine carefully the editorial and advertisement in Dec., 1876, *American Agriculturist*, and send for circular to

DEXTER SPRING CO.,
Hulton, near Pittsburgh, Pa.

AUTOMATIC WAGON BRAKE

The most powerful self-acting brake made, and yet is more simple and complete than any ever introduced for general use. The Brake has been fully endorsed by every farmer who has seen it operate. W. A. Armstrong, Sec'y Elmira Farmers' Club, writes: "A Committee of the Elmira Farmers' Club, consisting of Chas. Heller, John Bridgman, D. T. Billings, S. M. Carr, and M. H. Thurston, gentlemen fully competent to make intelligent judgment, gave the brake careful trial Aug. 21st, and reported unanimously: It is the best brake we have ever seen—prompt in its action—effective when required, and is exceedingly desirable for all farmers on hilly farms." See illustration in Aug. *Am. Agriculturist.* Town, County, and State rights for sale. Please say where you saw this.

D. L. MULFORD, General Agent,
TIOGA, TIOGA CO., PA.

A long felt Need supplied.

The **SENSIBLE COLLAR PAD** is just what its name suggests, a perfect Leather Pad, combining the advantages of Firmness, Elasticity, and the medicinal properties of tanin. No pad ever before introduced gives such universal satisfaction. They are warranted to cure sore necks and to prevent galls. Ask your harness maker for them. Manufactured by the SOLE LEATHER PAD CO., of Olean, N. Y.

250 MARYLAND FARMS, in Tracts from 30 to 300 acres.

Near railroad and navigable Salt-water (with all its luxuries), in Talbot Co., Md. Climate mild and healthy. Titles good. New Pamphlet and Map showing *location*, free. Address C. E. SHANAHAN, Atty., Easton, Md.

CHEAP VIRGINIA FARMS

CATALOGUES SENT FREE.
CHAFFIN, STAPLES & CO., Richmond, Virginia.

BEST AND CHEAPEST BERRY CRATES AND BASKETS

In use. So acknowledged by leading Growers everywhere who have used them for years. A. M. Purdy, Editor Fruit Recorder, and large fruit grower, Rochester, N. Y., writes: "Purchased 200 N. D. Batterson's Crates and Baskets, and must say, for compactness, durability, lightness, neatness and free circulation of air, have never found their equal." Well made; best materials, sizes and shape; Crates are iron bound, have best harps made; Baskets fit nearly all other crates, can be nested. Order by freight immediately; delay occasions loss. Remit by registered letter with order. Greatest satisfaction guaranteed. 32 qt. Crates, complete, 24 in. long, 12 in. wide, 15¾ in. high, $1.35; 36 qt Crates, 24 in. long, 17¼ in. wide, 12 in. high, $1.40; 30 pk. Crates, complete, 24 in. long, 10 in. wide, 10½ in. high, $1. Quart Baskets, $15 per 1,000; Pint Baskets, $10 per 1,000, in any quantities.

THE CHARTER OAK SWIVEL PLOW.

THE ONLY PERFECT SWIVEL PLOW.

ORONO, ME., Aug. 16, 1875.

Dear Sir:—We have to-day tested, by actual trial, the efficacy of the Charter Oak Swivel Plow that you sent me some weeks since. It was used on dry, stiff loam grass land. The ground was somewhat sloping, and the furrows were turned up the slope. I expected a failure, and seemed likely to realize my expectations as the furrow slice would slip over the end of the mold-board, and fall back into the furrow. It then occurred to me to try the effect of expanding the brace that held the mold-board in position. This done, the mold performed its work admirably, completely inverting the furrow-slice, and leaving the bottom side up with ease.

I have long doubted the possibility of constructing a swivel plow which would do good work on level or slightly undulating land. I am no longer faithless, for I have seen the Charter Oak Swivel Plow accomplish this.

Very truly yours,
J. R. FARRINGTON,
Farm Sup't Maine State College.

Send for illustrated circular with full particulars to

THE HIGGANUM M'F'G CO.,
HIGGANUM, CONN.

HOLBROOK SWIVEL PLOW.

THE STANDARD OF AMERICA.

This well known plow has been much improved since first introduced. There are many thousands in use. It has no equal. **Price reduced for 1877.** Send for descriptive circular. Manufactured only by

EVERETT & SMALL, Boston, Mass.

THE GILPIN SULKY PLOW.

Constructed entirely of iron and steel. Easily operated entirely by *one lever*. Simple, strong, durable. Performs better work in unskilled hands than a skillful plowman can do with walking plow. 7,000 sold and in use in two years, giving unbounded satisfaction. Gold Medal at Illinois State trial 1874, and Indiana State trial 1876, the two highest ever awarded sulky plows.

R. H. ALLEN & CO., 189 Water St., New York, Agent.
DEERE & CO., Moline, Ills. Established 1847. Manufacturers of Steel Plows of all sizes, especially adapted to sticky soils, Gang Plows and Cultivators. Send for circulars.

HAKES PATENT SWIVEL PLOW Improved.

Superior to all others for turning and pulverizing on level land or hill-side, and strong and durable, easy draft. Take a wide furrow. Send for Circulars. Liberal discounts to agents and dealers. Correspondence solicited. Made only by H. B. HAKES, 146 Central Street, Worcester, Mass.

BRADFORD MILL CO.
Successors to Jas. Bradford & Co.
MANUFACTURERS OF
French Buhr Millstones, Portable Corn & Flour Mills, Smut Machines, etc.
Also, dealers in Bolting Cloths and General Mill Furnishing.
Office & Factory, 158 W. 2d St.
CINCINNATI, O.
J. R. Stewart, *Pres.* W. B. Dunlap, Sec.
☞ PRICE-LISTS SENT ON APPLICATION

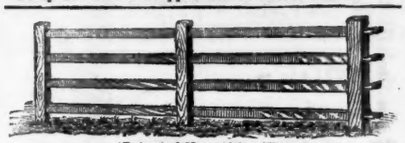
BURR STONE GRIST MILLS
AND
Flouring Machinery.

Catalogue and Price List Free.

The Centennial Prize Medal and Diploma.
LEONARD & SILLIMAN, Bridgeport, Conn.

WANTED — Situation as Supt. of Cemetery, by a Scotchman. A Gardener of long practical experience, and for the last seven years associated with Mr. Strauch, in laying out and improving Public Grounds. The best of References. Apply to ADOLPH STRAUCH, Esq., Supt. Spring Grove Cemetery, Cincinnati, Ohio.

GIANT POWDER.
MANUFACTURED BY THE
ATLANTIC GIANT POWDER CO.,
61 Park Place, New York.
Price, per lb.....50 cts. | Caps or Exploders, each 02 cts.
Fuse, per 100 feet.....75 cts. | Nippers, per pair.....50 cts.
Pamphlets mailed on application to above address.



(Patented Nov. 16th, 1875.)

SEABURY'S IMPROVED FENCES for **Farms, Lawns, and Rail-Roads.—A Fence** of Wood and Wire combined. No nails in its construction. Requires no skilled labor to put it up. More durable and cheaper than any fence in use of equal strength. It cannot be blown down in any of its parts, and a washing out of post now and then does not impair its utility. Sold complete for putting up from **7 cents per foot** and upwards, according to number of Rails—delivered on route of transportation.

Information given, upon application to
AMERICAN FENCE MFG. CO.,
100 East 14th St., New York City.
Or WM. H. MANN, General Agent,
417 Walnut Street, Room No. 3, Philadelphia, Pa.
Where different styles of this fence may be examined.

SMITH'S

"Eagle Claw of '76."

A safe and ingenious device for catching fish, animals, game, &c. Sample, 50 cts., by mail, or send stamp for circular,

Address **EAGLE CLAW CO.,**
713 Sansom St., Phila., Pa.

FRIENDS, if you are in any way interested in **BEES or HONEY,** we will with pleasure send you a sample copy of our **Monthly GLEANINGS IN BEE CULTURE,** with a descriptive price list of our latest improvements in **Hives, Honey Extractors, Artificial Comb, Section Honey Boxes,** all Books and Journals, everything pertaining to Bee Culture. *Nothing patented.* Simply send your address on a postal card, *written plainly,* to
A. I. ROOT, Medina, Ohio.

IMPERIAL EGG FOOD.

[Trade Mark, secured by letters patent.]

Will make Hens Lay!

Used by best poultry men all over the country. Packages sent by mail for 50 cts., $1 and $2. Circulars with testimonials free. References: H. T. Sperry, Pres't Conn. State Poultry Soc'y; H. H. Stoddard, author of "Egg Farm" and editor of "Poultry World;" Geo. P. Burnham, author of "Secrets in Fowl Breeding."

Liberal commissions paid to reliable men for selling.
CHARLES R. ALLEN, Proprietor,
29 Pearl Street, Hartford, Conn.

FOR SALE.—Game Chickens and Eggs. Entire satisfaction guaranteed. Correspondence fully and carefully answered. Write for prices.
J. W. REYNOLDS, Cuckoo, Va.

DAY'S
AUTOMATIC INCUBATOR.
Highest Centennial Award. Chickens hatched and reared summer and winter. Machine used as Incubator and Artificial Mother at same time. Capacity, 220 eggs. Price, $50. See July *Agriculturist*, 1876. Address
DAY BROS. & CO.,
92 Linden Avenue, Baltimore, Md.

GAME FOWL. Red Irish Setters. and Carrier Pigeons, bred and shipped by **J. C. COOPER, Cooper Hill, Limerick, Ireland,** winner of Gold Medals at Paris and New York; also Thoroughbred Hounds, Beagles, and other Dogs. J. C. C. can likewise select **Sheep, Cattle, and Horses** for clients, having had long and large experience in them.

High Class Poultry.

Light and Dark Brahmas, Partridge and White Cochins, Brown and White Leghorns, Houdans, and G. S. Bantams. For sale at all seasons, at reasonable prices. Eggs, securely packed in new baskets, $3.00 per 13, or $5.00 for 26. Please state explicitly what you want.
GEO. S. JOSSELYN, Fredonia, N. Y.

Black Bass for stocking ponds—**Pekin Ducks, Bronze Turkeys,** descended from a pair weighing 62 lbs. **Jersey Cattle,** A. I. C. C. R., and Cotswolds, at low prices. Address W. CLIFT, Mystic Bridge, Ct.

A PERSON WANTED, to join in extensive raising of improved live stock, in connection with orange growing, in an unexcelled location in Florida. To one of means, with a thorough knowledge of breeding live stock of all kinds, desiring a southern residence, a fine opportunity for profitable investment is offered. Or would sell a desirable property with good start in the business indicated.
Address W. C. W., Hibernia, Florida.

FOUST'S HAY LOADER.—A perfect machine for rapidly pitching hay, barley, and all loose grain on the wagon, in the field. Increased success in the harvest of 1876. Received the highest and only award for Hay Loader, with Diploma of Merit at Centennial Exposition, based on field trial. Thousands in successful operation. Manufactured by STRATTON & CULLUM, Meadville, Pa. Send for circulars early. See *American Agriculturist* for November, 1876.
HINGMAN & CO., Peoria, Agents for Central Illinois.

EDEN'S BREED OF SWINE.

Imported by the undersigned from Lancashire, England. These swine have taken first premiums wherever exhibited in England and this country. Advantageous to producers. White in color, well haired, very hardy, small waste, easily fattened, very prolific, large size, mature early. Send for descriptive circular.
W. G. LEWIS, Lawn Farm, Framingham, Mass.

FARMER'S
VETERINARY ADVISER,
By PROF. I. LAW, Cornell University, Ithaca, N. Y.
"The best work on the diseases of animals in the English language."—*Country Gentleman.*
Sent by mail from the Author for **$3.**

BEACON FARM, *Northport, Long Island,*
BREEDERS OF
Alderney and Ayrshire Cattle,
COTSWOLD SHEEP & BERKSHIRE SWINE.
Also FANCY POULTRY of choicest kinds, bred from the best stock. Address
J. N. ROBINS, Manager.

WILLIAM CROZIER,
BEACON HILL, Northport, L. I., N. Y.,
Received a Medal and Diploma on his stock at the Centennial Exhibition, Importer and Breeder of Clydesdale Horses, Ayrshire and Jersey Cattle, South-down Sheep, and Improved Berkshire Hogs—and English Dorking Fowls.

N. GUILBERT,
Evergreen Farm, Gwynedd, Pa.,
Importer and Breeder of Improved Blooded Live Stock, Horses, Cattle, Cotswold and Southdown Sheep, Chester, Berkshire and Yorkshire Pigs, Toulouse, Bremen, Hong Kong, White China and Wild Geese, Cayugas, Rouen, Aylesbury, Pekin and Musk Ducks, Bronze, Blue, Buff and White Turkeys, Dorkings, Brahma, Cochin, Guinea and all other Fowl, Deer, Swans, Peacocks, Pigeons, Eggs, &c., at low prices. Best Breeds of Dogs and Maltese Cats, Rabbits, Ferrets, Guinea Pigs, White Mice, &c. Song Birds of all kinds.
Fine Milch Cows always on hand.
Ferrets at five dollars each. Swan and Deer wanted.

"CHERRY BROOK FARM"
Large White Yorkshire Pigs, 16 weeks 27th Jan., $10 each. **Finely marked Partridge Cochin Chicks,** $3 each. HUBERT MERRIAM, Weston, Mass.

Graves & Breed,
Breeders and Shippers of Thoroughbred Registered Short Horns, Sheep, Hogs, Poultry, Pigeons, &c.
Circulars free.
HATFIELD, MASS.

Purebred Calves, Chester White, Berkshire and Yorkshire Pigs, Scotch, Skye, and Shepherd pups, Poultry and Pigeons, all of the finest imported strains, bred and for sale by Francis Morris, Norton, Del. Co., Pa. Send for circular.
FRANCIS MORRIS, P. O. Box 2292, Philadelphia.

G. W. FARLEE, CRESSKILL, N. J.
(1 hour from New York) for past twelve years breeder of JERSEY CATTLE.

FINEST NEW CATALOGUE of blooded Cattle, Sheep, Hogs, Poultry, and Dogs. Price 20c. Every farmer wants it. BENSON & BURPEE, Philadelphia, Pa.

Imported English Yorkshire Pigs,
of both medium and small breeds, skillfully bred, from imported stock of the most approved strains of blood. They are white color, well formed bodies, quiet, good feeders, very prolific, excellent nurses, and ready fatteners. Sent to destination at my risk, and warranted as represented. Illustrated catalogue free as soon as ready. Also Holstein and Short-horn Cattle. Address **Joseph Knight,**
Marlborough Stock Farm, P. O. Box 332, Newburyport, Mass.

FOR SALE. A very desirable Farm—**675 acres—28 miles north of Richmond on the Northanna river, and within a quarter of a mile of Hanover Junction. Two Railroads pass through the land. It is one of the best farms in the County. There is a good dwelling with 6 rooms, and all the necessary outbuildings. For terms address,**
C. F. M. GARNETT,
Junction P. O., Hanover Co., Va.

H. W. JOHNS' PATENT. ASBESTOS MATERIALS.

PAINTS—all Shades—Ready for use. **Roofing, Roof-Coating, Sheathing, Boiler Coverings, Steam Packing, etc.**
Send for Pamphlets, Reduced Price List, etc.
87 MAIDEN LANE, NEW YORK.

Brick Machines.

The cheapest in market. Makes the most perfect brick. Tile Machines. Great variety. Prices reduced to suit the times.
J. W. PENFIELD, Willoughby, O.

W. S. BLUNT'S "UNIVERSAL FORCE PUMPS."

Date of Patent, Aug. 8th, 1876.

After six years endeavor to furnish the most reliable force pumps in the market, the above pumps are respectfully offered, as the best results, in my judgment, of the public requirements.

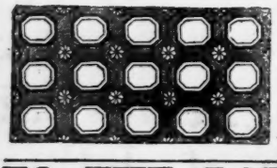
Their **adaptability, great power, careful finish** in detail, and consequent **economy,** will commend them. In case of accident, any part can be easily replaced, without sacrificing the whole pump. They can be immediately converted from **right** to **left-hand pumps,** by swiveling the air-chamber and handle to any required angle with the spout. They are changeable from lift to force pumps. Are for the house or for out-door wells of any depth, and having close tops, can not be tampered with.—**Also, Blunt's Sand Vacuum Chambers,**—A complete protection against sand or gritty water in **dug or driven wells, pits, mines, and rivers.** For **hand or steam pumps,** all sizes, from 1¼-inch to 4-inch suction pipe.
Send for circulars to **NASON M'F'G CO., 71 Fulton and 71 Beekman St., New York.**

GARDEN ENGINE AND FIRE EXTINGUISHER.—Protects Buildings from Fire, and Trees, Vines, etc., from Insects. Throws water 50 ft. Easily carried. No Dwelling, Country Home, or Factory should be without the Fountain Pump. Send for large Illustrated Circular. J. A. WHITMAN, Sole Proprietor and Manufacturer, Providence, R. I.

SCROLL SAWS
from $2.50 to $25.00 each. Saw Blades—Wood—Designs—Saw Frames—and all appurtenances. Send for Price List.
G. WEBSTER PECK, Manufacturers' Agent, 110 Chambers St., New York.

PISTOLS.

Eclipse single-cartridge pistol shoots No. 1 charges, 22-100 calibre; just right for vest-pocket; 2¾ inches length of barrel; weight 4 oz. Elegant nickel silver plate; best English steel rifled barrel. A perfect little gem. Every family needs one to keep off tramps and burglars. Sent post-paid for $1.50, or by express, with 100 charges for same, $1.60. H. O. ROSE, Saybrook, Conn.



CEILING FELT for Rooms in the place of Plaster. **FELT CARPETING,** 30 to 45 cts. per yd. For Circular and Sample, Address, C. J. FAY, Camden, N. Jersey.

TO THE LADIES!!

BROWN'S FRENCH DRESSING

will make Ladies' and Children's Boots and Shoes that have become rough and red, and Ladies' Traveling Bags which look so old and rusty that they are ashamed to carry them, look just as good as new. It will not rub off or smut when wet. Softens the leather.
No lady will be without it after one trial. Beware of imitations and counterfeits. For sale everywhere.
B. F. BROWN & CO., Boston, Mass.

Keep's Custom Shirts made to measure.
The very best, 6 for $9, delivered free everywhere.
Keep's Patent Partly-Made Dress Shirts.
The very best, 6 for $7, delivered free everywhere.
An elegant set of Gold plate collar and sleeve Buttons given with each half dozen Keep's shirts.
Samples and full directions mailed free to any address.
Merchants supplied at a small commission on cost.
Trade circulars mailed free on application.
Keep Manufacturing Co., 165 Mercer St., New York.

CAPEWELL'S Pottage Tongs, Tack Hammer & Knife Sharpener.

world sharpening knives and scissors, and cutting glass. Samples by mail, 25 cents each. All three for $1. G. J. CAPEWELL & CO., CHESHIRE, CT.

Turns with half the labor of other Wringers.

Take it on trial with any other and buy the best.

The **"CLIMAX"** is the **latest improved UNIVERSAL Wringer** with the addition of a **PURCHASE GEAR** and a **STEEL SPRING,** which cause it to **turn with half the labor** that is required in turning other wringers, and prevent the usual strain upon the rolls. **It has no equal in case of operation, strength, or durability.**
AGENTS WANTED everywhere. Exclusive sale given. Send for terms, &c.
N. B. PHELPS, Sole Agent, 102 Chambers St., New York.

THE IMPROVED ARMOUR FAMILY KNITTING-MACHINE

KNITS A COMPLETE STOCKING **ANY SIZE.**

Also,
Double-Striped MITTENS and a Great Variety of FANCY WORK.

Price $40.

But to introduce our machine into all parts of the country, we have determined to sell
Two SAMPLE MACHINES Only in each county, for
$19 Each.

The number will be *limited*, as each sale at the low price is *simply to introduce the machine.*
AGENTS Wanted *to continue the business.* Order early, and secure one.
This machine was awarded First Prize at New York and Ohio State Fairs last year; also at several County Fairs.
Address ARMOUR KNITTING MACHINE CO., Watertown, New York.
Full instructions for operating accompany each machine. The ordering of two machines secures the county agency.

BABBITT'S TOILET SOAP.

Unrivalled for the toilet and the bath. No artificial and deceptive odors to cover common and deleterious ingredients. After years of scientific experiment the manufacturer of B. T. Babbitt's Best Soap has perfected and now offers to the public
The Finest Toilet Soap in the World.
Only the purest vegetable oils used in its manufacture.
For Use in the Nursery it has No Equal.
Worth ten times its cost to every mother and family in Christendom. Sample box containing 3 cakes of 6 ozs. each, sent free to any address on receipt of 75 cents.
Address **B. T. Babbitt, New York City.**
☞ For Sale by all Druggists. ☜

SMOKY CHIMNEYS cured, fuel saved, and heat increased by applying the Spiral Draft. Send stamp for circular (with testimonials) to HENRY COLFORD, 726 Sansom St., Phil'a, Pa.

Received Highest Honors conferred at Centennial.

Latest Invention, and producing most Marvelous Results.

Only machine *in the world* with Automatic Tension and Stitch Indicator.
Trade Mark in base of every machine.

NEW WILLCOX & GIBBS

AUTOMATIC

SILENT SEWING MACHINE.

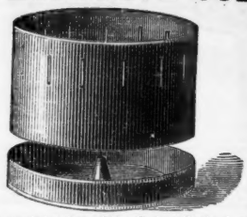
Send Postal Card for Illustrated Price List, &c.
Willcox & Gibbs S. M. Co.,
(Cor. Bond St.) **658 Broadway, New York.**

AGENTS WANTED.—Send 3c. stamp for samples and catalogue of novelties. Address CITY NOVELTY CO., 108 South 8th St., Philadelphia, Pa.

Have you read my advertisements in this number? Read them and send for Price List.
WALDO F. BROWN.

THE ZOETROPE COLLAR.

Patented April 23, 1867. Patented Nov. 28, 1876.



Each Box contains ten of the Latest Style Collars. Three Pictures and Directions for running the Zoetrope, or Wheel of Life; a beautiful toy, pleasing alike to old and young. Price 50 cts. All first-class Jobbers and Dealers have them.
RAY & TAYLOR MFG. CO.,
SPRINGFIELD, MASS.

AGENTS WANTED.

Goodyear's Pocket Gymnasium.

ENDORSED BY THE MOST EMINENT PHYSICIANS.

The Most Complete System OF PHYSICAL EXERCISE Ever Devised for Home Practice.
100,000 in use by men, women and children.
Used standing, sitting or reclining.
Hundreds of graceful movements.
For home, office, schools, hospitals.
Price List.—No. 1, for Children 4 to 6 years, $1.00. No. 2, for Children 6 to 8, $1.10. No. 3, for Children 8 to 10, $1.20. No. 4, for Children 10 to 14, $1.30. No. 5, for Ladies and Children 14 years and upwards, $1.40. No. 6, for Gentlemen of moderate strength, $1.50. No. 7, used by Ladies, Children or Gents, $2.00. No. 8, for Gentlemen of extra strength, $2.50. Full set, *family use*, 1 each, (1 to 6) Two 7's and Two 8's, $16.00. Nos. 7 and 8 are fitted with a screw-eye and hook to attach to the wall or floor. A pair of No. 7, ($4.00), or 8, ($5.00), make a complete Gymnasium and Health Lift. Sent post-paid on receipt of price. **Exclusive Agencies granted in unoccupied territory.**
Exclusive rights to sell the Pocket Gymnasium afford the largest possible returns for small investments. Its sales are nearly universal wherever it is placed before the public and its merits fully understood.
For Illustrated descriptive circulars, terms, &c., address,
Goodyear Rubber Curler Co.,
P. O. Box 5,156. **697 Broadway, New York.**
RUBBER GOODS OF EVERY DESCRIPTION.

VALUABLE HOLIDAY GIFT!

BRANSON KNITTER, $20.

Simpler and much easier learned than any Sewing Machine. Work surpasses that made by hand. Canvassers make traveling expenses by work which they do in showing the Knitters.
AGENTS WANTED—SEND FOR CIRCULAR.
Branson Knitting Machine Co., Limited,
224 S. Fifth St., Philadelphia.
235 State St., Chicago.

LOOK! AGENTS make $12 per day selling our NOVELTIES. Catalogues free.
T. J. HASTINGS & CO., Worcester, Mass.

MAGIC LANTERNS

and **STEREOPTICONS. CENTENNIAL MEDAL** and **DIPLOMA. 74-page Catalogue,** fully illustrated, *sent free*, with list of pictures on every subject. For **SUNDAY SCHOOLS, PARLOR ENTERTAINMENTS,** and **PUBLIC EXHIBITIONS.** *Pays well. Small capital required for an outfit.*
McALLISTER, *Mfg. Optician*, 49 NASSAU ST., N. Y.

AMERICAN CATTLE.

Their History, Breeding, and Management.

By LEWIS F. ALLEN.

ILLUSTRATED. PRICE, POST-PAID, $2.50.

This book will be considered indispensable by every breeder of live-stock. The large experience of the author in improving the character of American herds adds to the weight of his observations, and has enabled him to produce a work which will at once make good its claims as a standard authority on the subject. An excellent feature of the volume is its orderly, methodical arrangement, condensing a great variety of information into a comparatively small compass, and enabling the reader to find the point on which he is seeking light, without wasting his time in turning over the leaves.

DWYER'S HORSE BOOK.

SEATS AND SADDLES, BITS AND BITTING,
AND
THE PREVENTION AND CURE OF RESTIVENESS IN HORSES.

By FRANCIS DWYER,
Major of Hussars in the Imperial Austrian Service.
ILLUSTRATED.
PRICE, POST-PAID, $2.00.

Either of the above books sent post-paid on receipt of price by
ORANGE JUDD COMPANY, 245 Broadway, N. Y.